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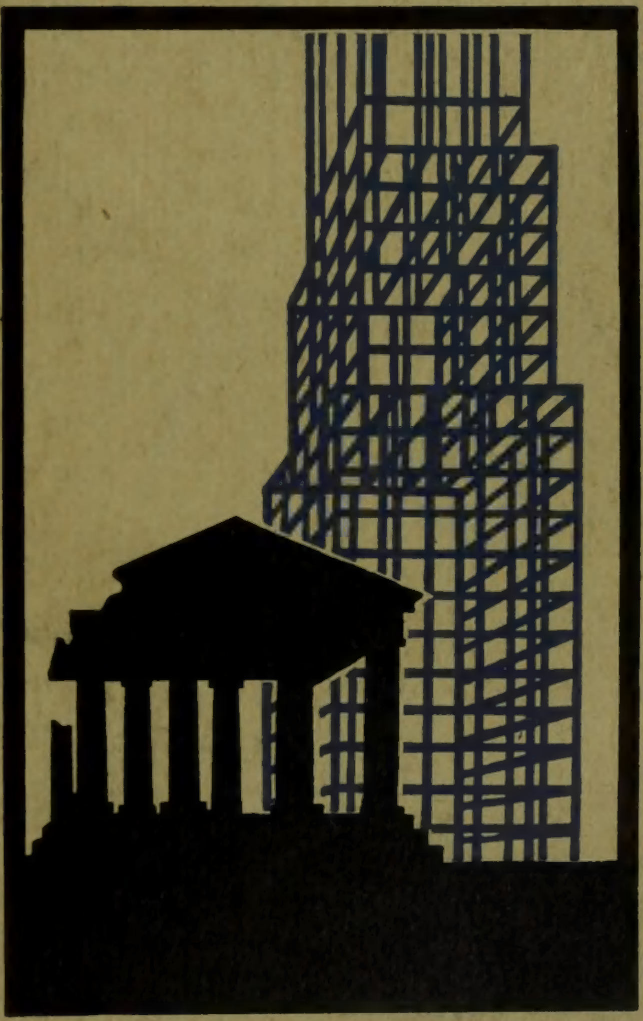
THE ARCHITECTURAL RECORD

208894



OCTOBER
1930

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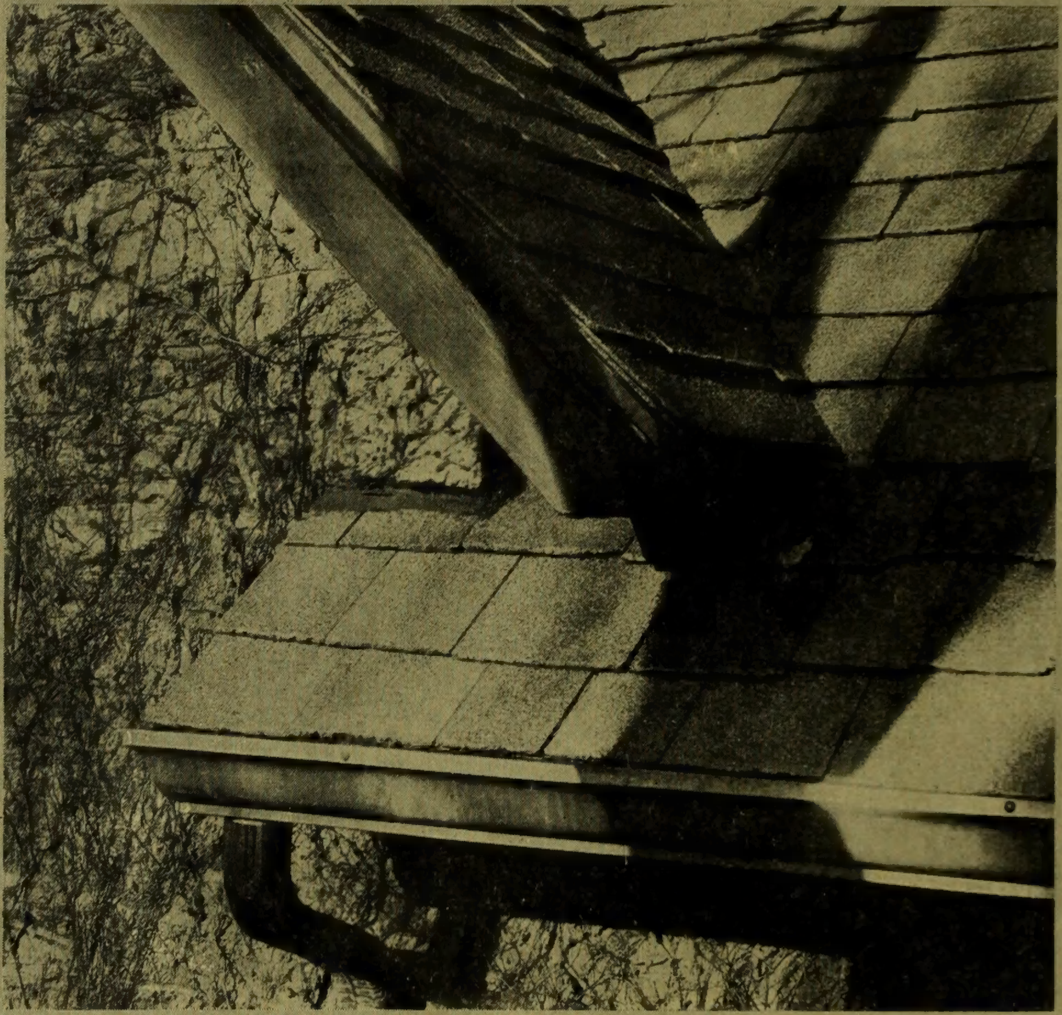

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THE ARCHITECTURAL RECORD

208894

Published Monthly by F. W. Dodge Corporation, 115–119 W. 40th St., New York

Truman S. Morgan, *President* Sanford D. Stockton, Jr., *Secretary* Howard J. Barringer, *Treasurer*

VOLUME 68 OCTOBER, 1930 NUMBER 4

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Yearly Subscription: United States, Insular Possessions, Cuba, Canada, Central America, South America, and Spain, $5.00; Foreign, $6.50; Single Copy 75c.

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Entered as second class matter May 22, 1902, at the Post Office at New York, N. Y., under the Act of March 3, 1879. Printed in U. S. A.

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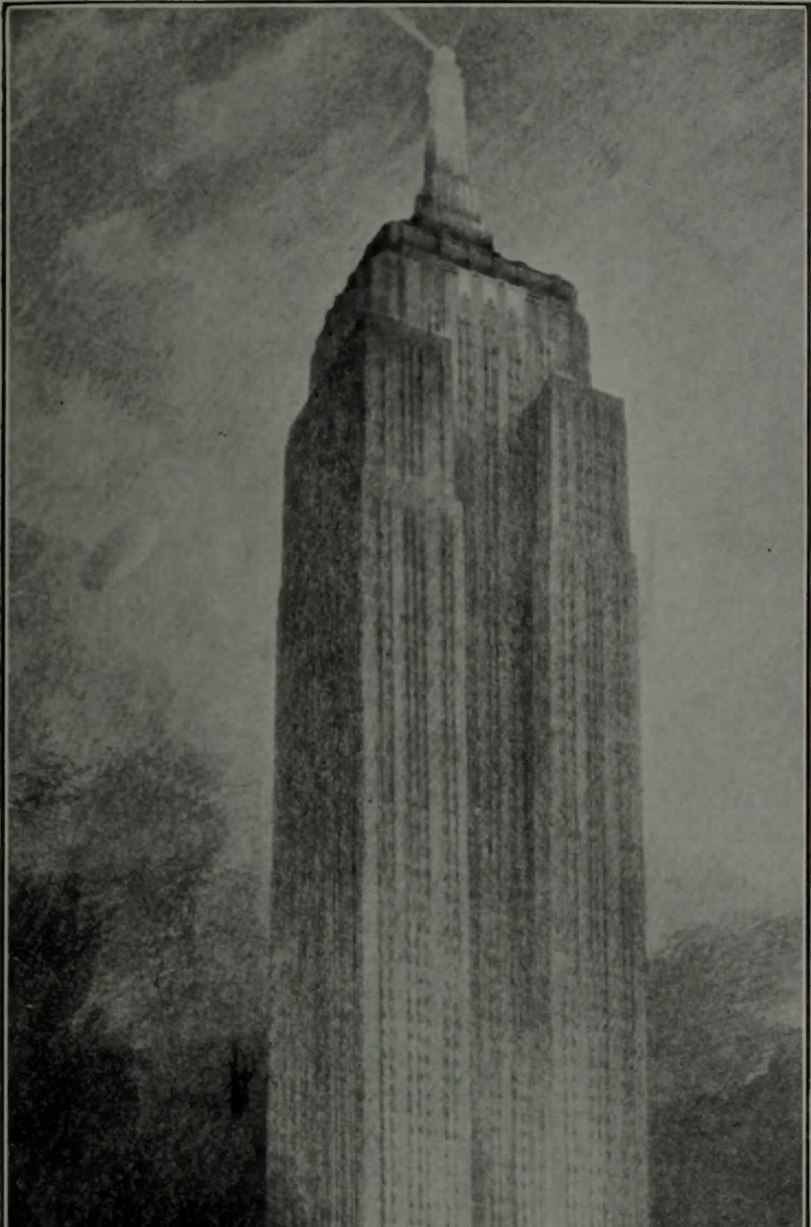

Empire State Building, New York City. Under construction on the site of Waldorf-Astoria Hotel. Shreve, Lamb & Harmon, Architects. Starrett Bros. & Eken, Inc., Builders. Cut-Stone Contractors, Wm. Bradley & Sons, James Gillies & Sons, J. J. Spurr & Sons, B. A. & G. N. Williams.

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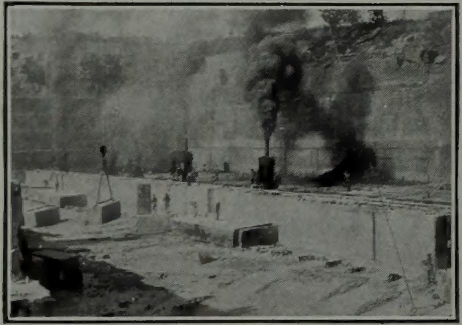

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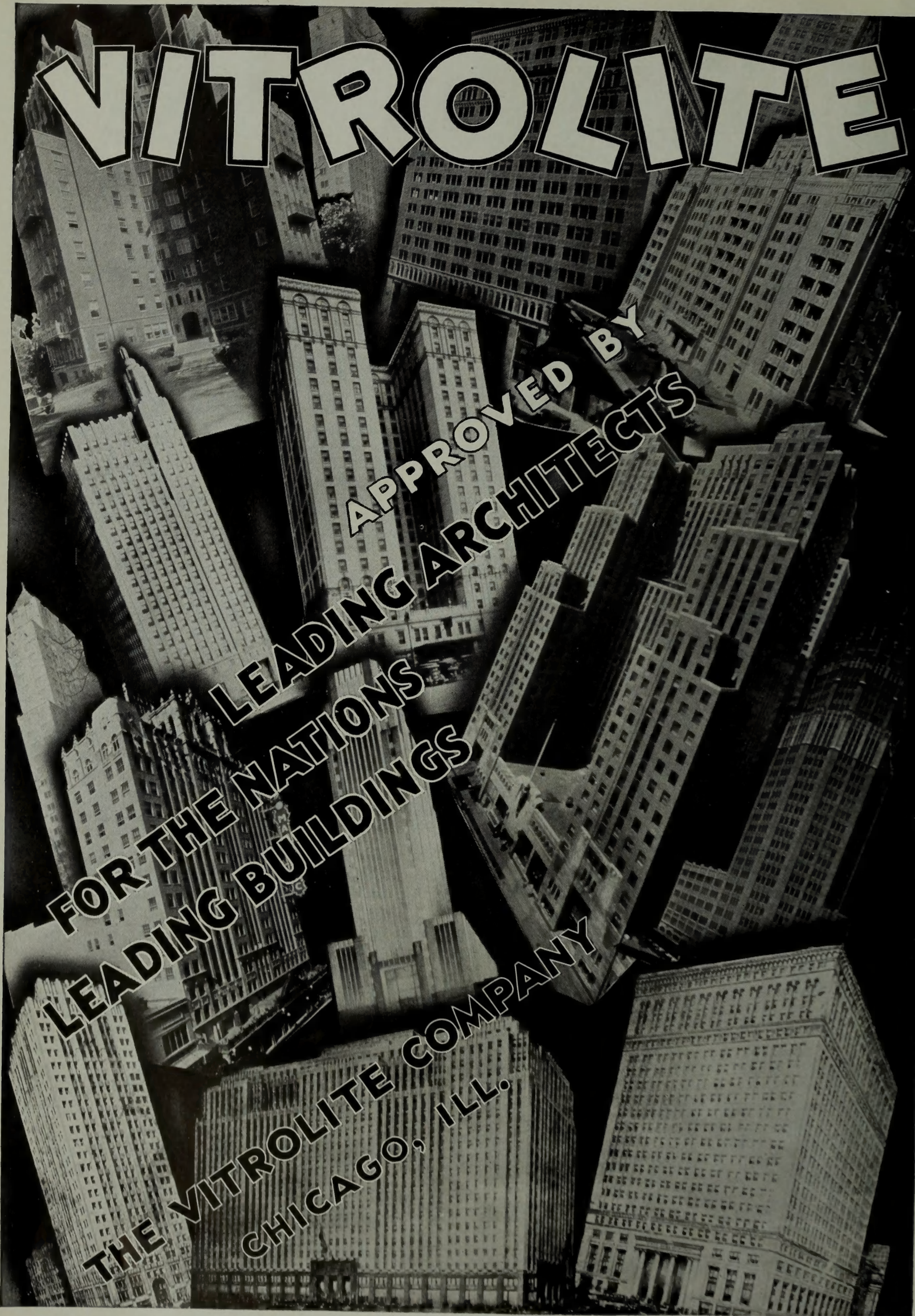
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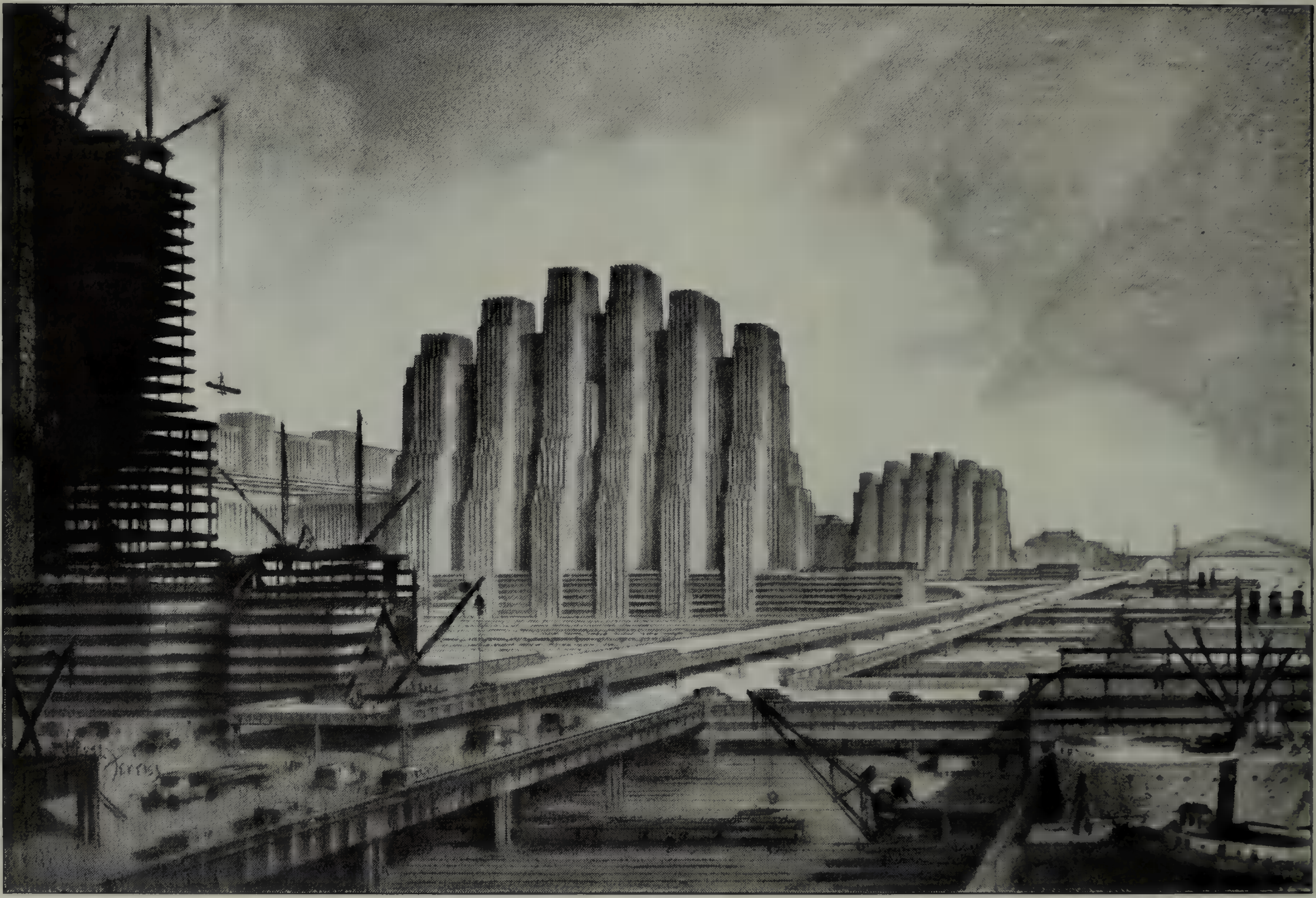

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How Alcoa Aluminum is used Architecturally, at the Wayne County, Michigan, Airport

Hangar at Wayne County, Michigan, Airport. Built by the Board of Wayne County Road Commissioners, under the special supervision of Mr. L. C. Smith, Engineer Manager, and Mr. H. E. Baker, Airport Engineer for Wayne County. Giffels and Vallet, Inc., Architects and Engineers, Detroit, Michigan. General Builders, Gallagher and Flemmin. Aluminum Contractor, Anchor Steel Engineering Company.

Alcoa Aluminum Spandrels, approximately 3 ft. by 5 ft. 6 in. View shows these spandrels as used on sides of hangar. Note Alcoa Aluminum Cornices, also.

Front, back and edge views of Alcoa Aluminum Cornices. Cast in lengths 6 ft. 6 in. long by 5½ in. by 3¾ in.

In designing the Wayne County Airport, which is one of the few airports in the United States to have an official A-1-A rating, Giffels and Vallet made generous use of Alcoa Aluminum.

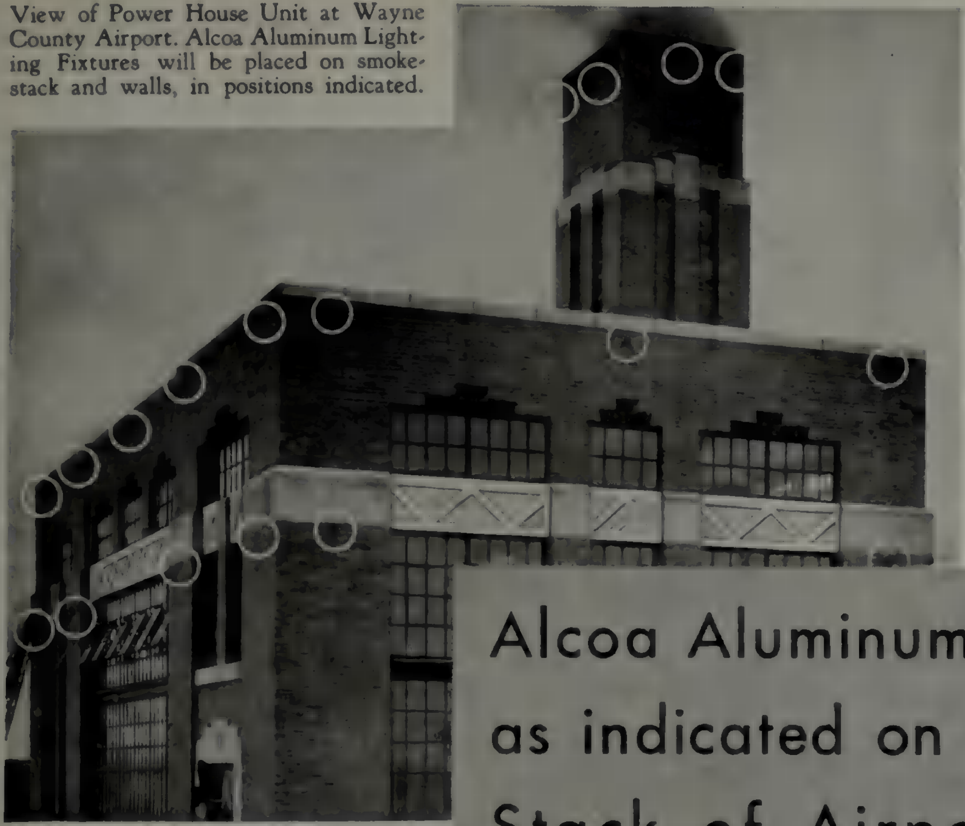
Following precedent, they specified Alcoa Aluminum Spandrels. 226 of these spandrels, approximately 3 ft. by 5 ft. 6 in., have a total weight of only 18,000 lbs. By using Alcoa Aluminum Spandrels, the whole structure was given a decided architectural character. In addition, a considerable saving was made in the structural members. The spandrels, cast in No. 43 Alcoa Aluminum Alloy, are themselves ⅔ lighter than similar spandrels cast in any other metal commonly used.

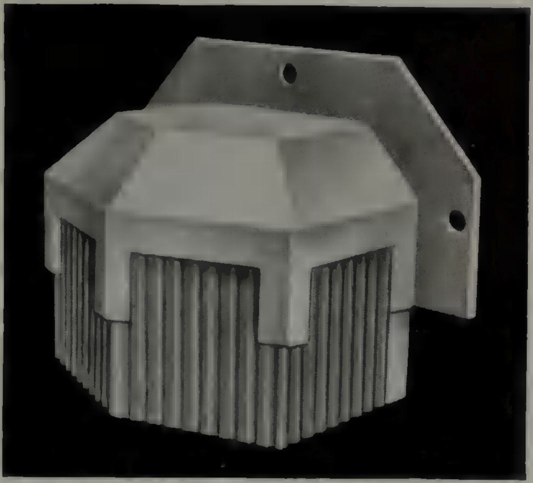
Next, the designers made use of Alcoa Aluminum for cornices. These were also cast of No. 43 Alcoa Aluminum Alloy, in lengths 6 ft. 6 in. long by 5½ in. by 3¾ in. The entire 1,014 feet of cornice, required, weighs only 3,000 lbs. Thus a further saving of approximately 6,000 lbs. was effected.

ALCOA
ALCOA ALUMINUM
TRADE MARK

ALCOA

View of Power House Unit at Wayne County Airport. Alcoa Aluminum Lighting Fixtures will be placed on smokestack and walls, in positions indicated.





Fixture No. 4 has dimensions of 14½ in. by 10 in. by 8 in. It is cast of Alcoa Aluminum with a ¼ in. wall and weighs only 10½ lbs.

Alcoa Aluminum Lighting Fixtures, as indicated on Walls and Smoke-Stack of Airport Power House

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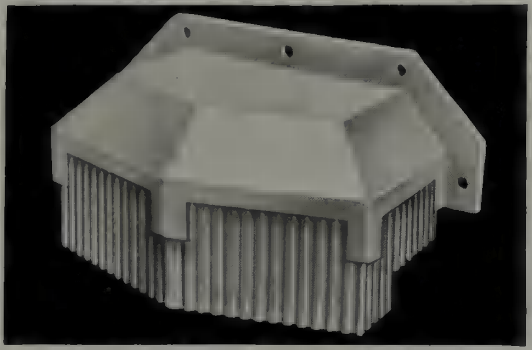
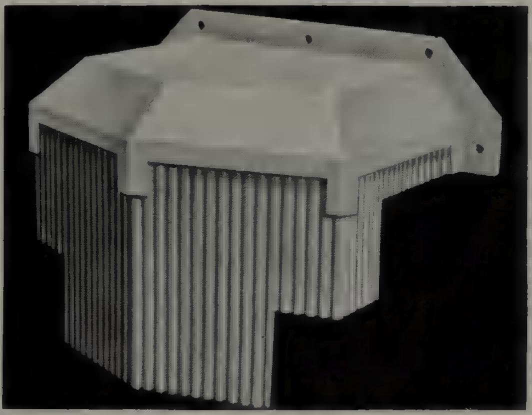


Fixture No. 3 weighs 20¼ lbs. It is 22 in. by 12½ in. by 12 in. Cast of Alcoa Aluminum with a ¼ in. wall.



Fixture No. 1 weighs 39¾ lbs. and is 28 in. by 18 in. by 20 in. It, too, is cast of Alcoa Aluminum with a ¼ in. wall.

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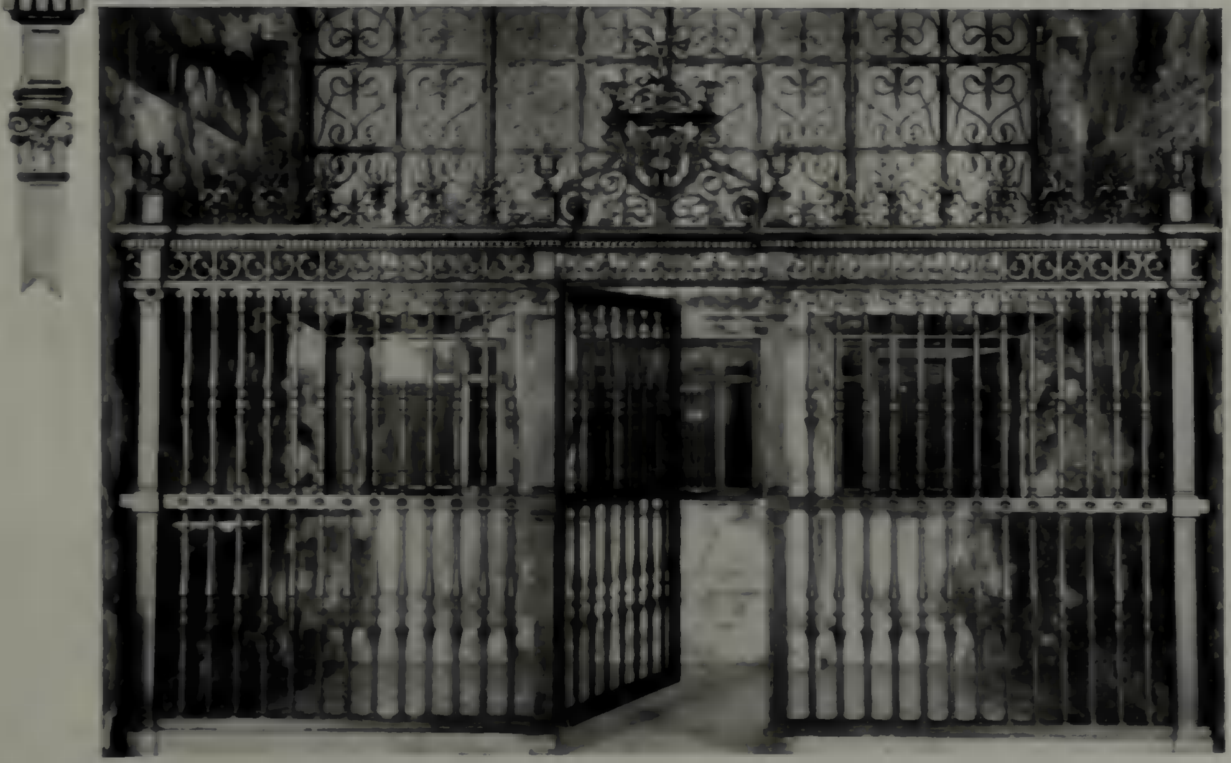
CLEVELAND, OHIO

Interiors of Banking Lobby



The side walls and pier facings in the Main Banking Lobby of this building are of Convent Sienna Marble, the floor—Tennessee. The barrelled ceiling is richly decorated in gold and color in the Roman manner. Lobby bays between the piers are screened with Iron grilles. Each bay, a private space adjacent to the Banking Screen, is allotted to Member Banks for business transactions. ✓ ✓ ✓ The grilles were originally designed for Wrought Iron. For economy, however, the work was Cast and the desired Wrought effect obtained by a baked enamel finish—in imitation of rusty iron. ✓ ✓ ✓ The arched window openings on the outer wall, shown in the background, are screened with glazed grilles. These were produced by similar methods of handling The entire Metal equipment of this building was fabricated by Flour City Ornamental Iron Plant,

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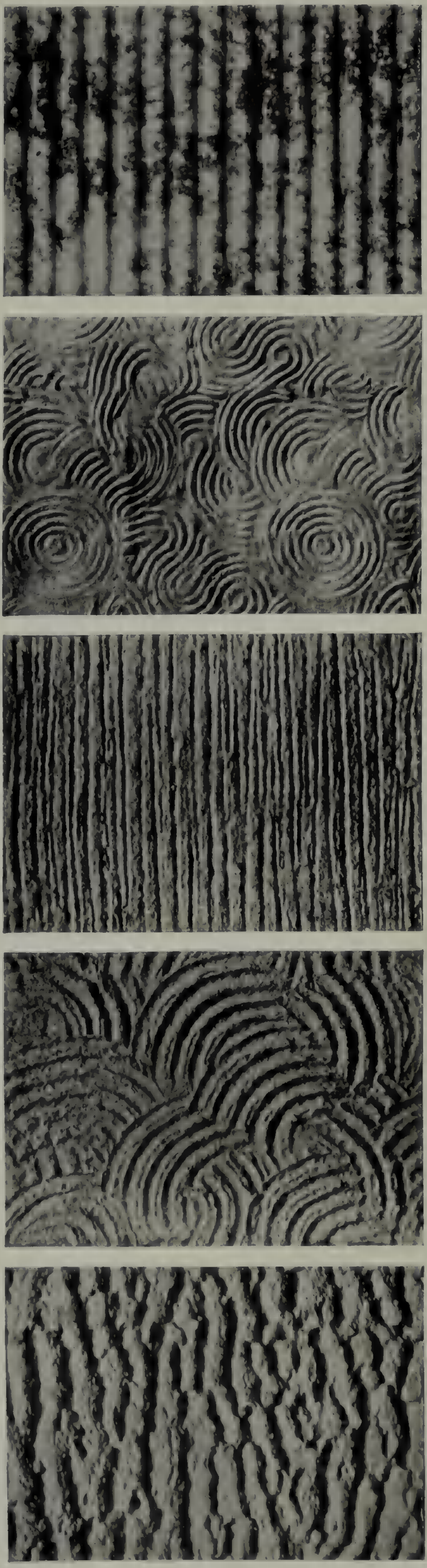

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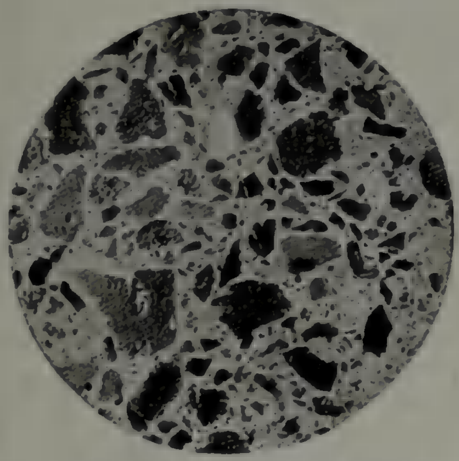

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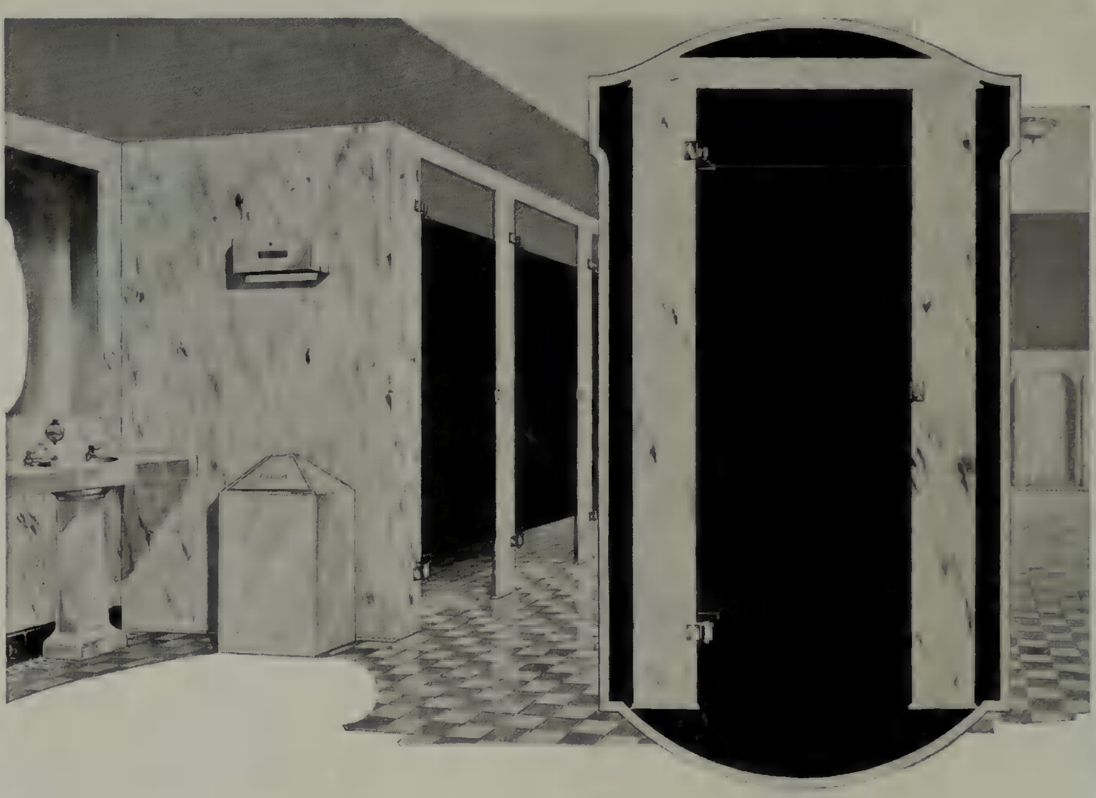

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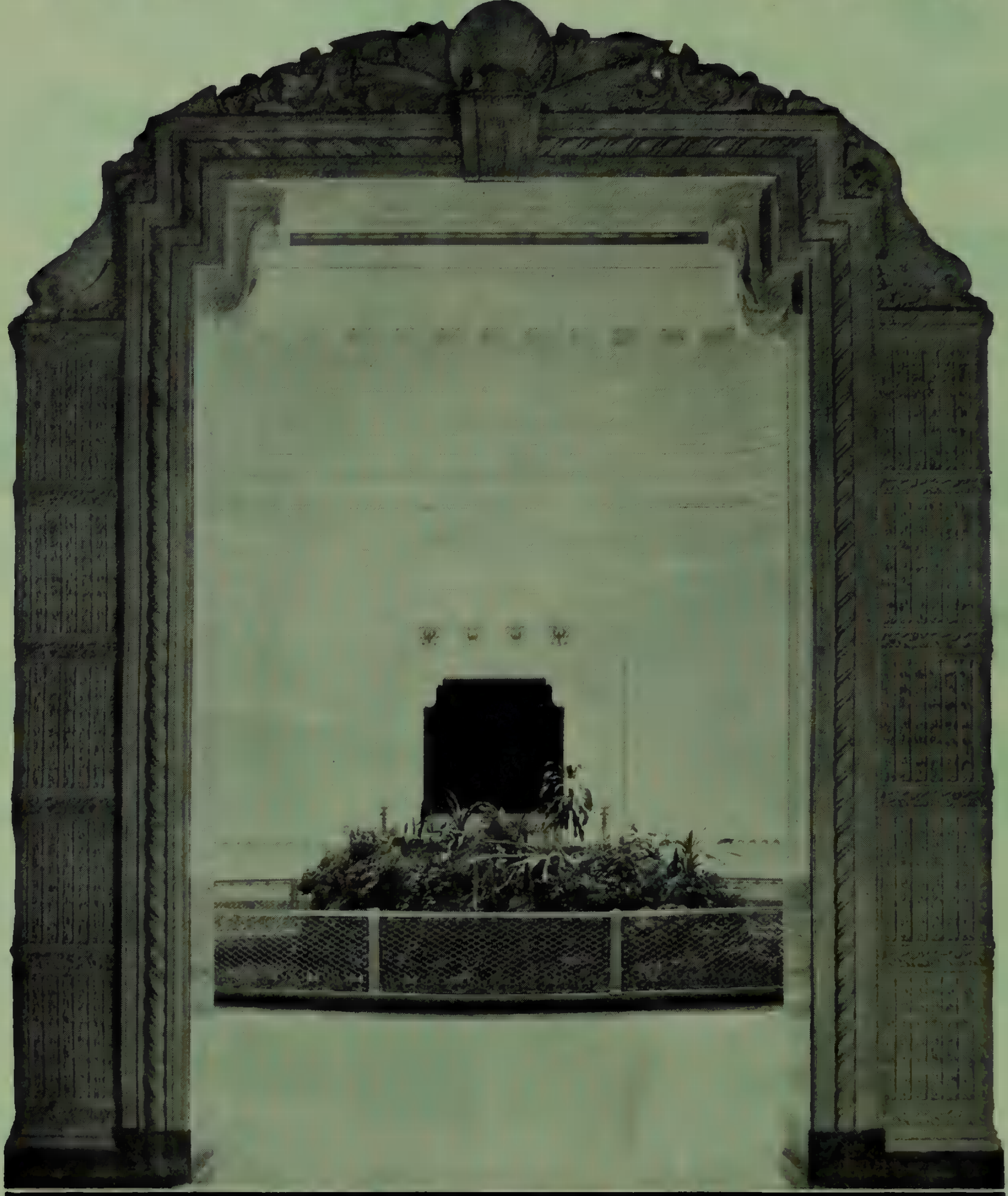
FOR LASTING BEAUTY



Entrance to room containing tropical pool, Shedd Aquarium, Chicago. Art marble around pool, made with Atlas White portland cement, furnished by Chicago Art Marble Co. Stucco finish on pre-cast portal, also of Atlas White, furnished by California Stucco Products Co., Chicago. Graham, Anderson, Probst and White, architects; R. C. Wieboldt Co., general contractor; John A. Boland Co., plastering contractor, all of Chicago.

ATLAS WHITE
PORTLAND CEMENT

On both exterior and interior of the beautiful Shedd Aquarium, Chicago, the use of Atlas White portland cement has added to the beauty and permanence of the new building.

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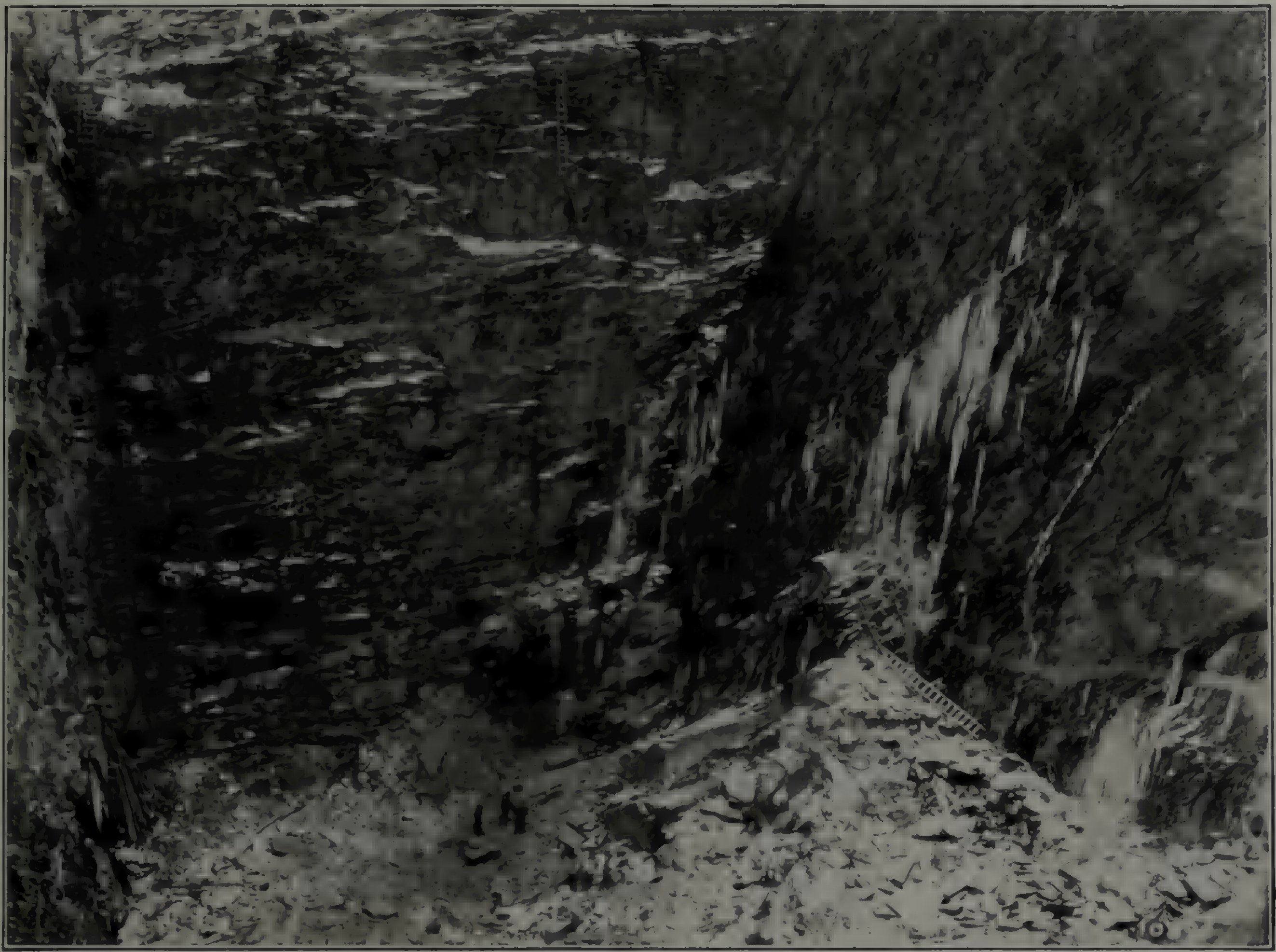
One of the holes you made us dig



In a way, this is a puzzle picture: "Find the three men." But when you have found them, you have a better idea of dimensions.

In another way, it isn't a puzzle at all.

To be sure, it is only one of our several quarries: the one from which we extract Sheldon's Unfading Mottled Purple and Green. But for all that, it is no puzzle that so gigantic a hole was made by your demand for these matchless colored slates.

For, as we enumerated in detail last month, you can demand all the protective qualities a roof should possess and a Sheldon Slate Roof will meet you one hundred per cent in all of them.

In addition thereto, its beauty graces any building, be it the acme in design and construction, and lifts practically every building into a higher class.

Furthermore (to come back from esthetics to material essentials) its life, being longer than that of the building, makes it an incomparable investment.

Good reasons, are they not? why you have made us dig such enormous holes.

Our pages in Sweet's give technical data, also illustrations in colors, to help you visualize certain Sheldon combinations.

But, better than anything else, permit us to render you the most efficient assistance possible in the selection of a Sheldon Slate Roof that shall possess "all the beauty of appropriateness."

F.C. SHELDON SLATE CO.

GENERAL OFFICES · GRANVILLE · N · Y ·

· BRANCHES IN PRINCIPAL CITIES ·

Hand-Laid *Sunshine* underfoot

There are 15,000 sq. ft. of Armstrong's Linotile in the halls, domestic science kitchens, and library of this new High School at Great Neck, Long Island, N. Y.

* *

It's so easy to wipe up spilled things in this domestic science kitchen. It's floored with Armstrong's Linotile, of course.

BRIGHT surroundings make cheerful pupils. That's one of the reasons a tailor-made floor of Armstrong's Linotile is so desirable. There is no limit to the colors and designs that may be used in these custom-built floors.

Armstrong's Linotile has the advantage of being quiet, too. A pencil dropped on this sound-muffling floor won't distract a student's attention. Nor will shuffling feet, nor footsteps out in the hall, disturb classroom concentration.

In halls, cafeterias, and libraries, in fact in every room of any public building, Linotile is just as successful. These floors are lasting. They're clean and sanitary as well.

And Linotile is a labor-saving floor. It is very easily and quickly installed. And once it is laid, light waxing and polishing will preserve its lustre indefinitely.

Let us send you our booklet, "Custom-Built Floors of Cork." It illustrates the thirty Linotile colors, and tells about the various tile sizes. It will also give you information about Cork Tile, another Armstrong's tailor-made floor. Write to the Armstrong Cork Company, Custom Floors Division, Lancaster, Penna.

Armstrong's
A
Product

In this quiet library the Linotile floor has been laid by expert workmen.

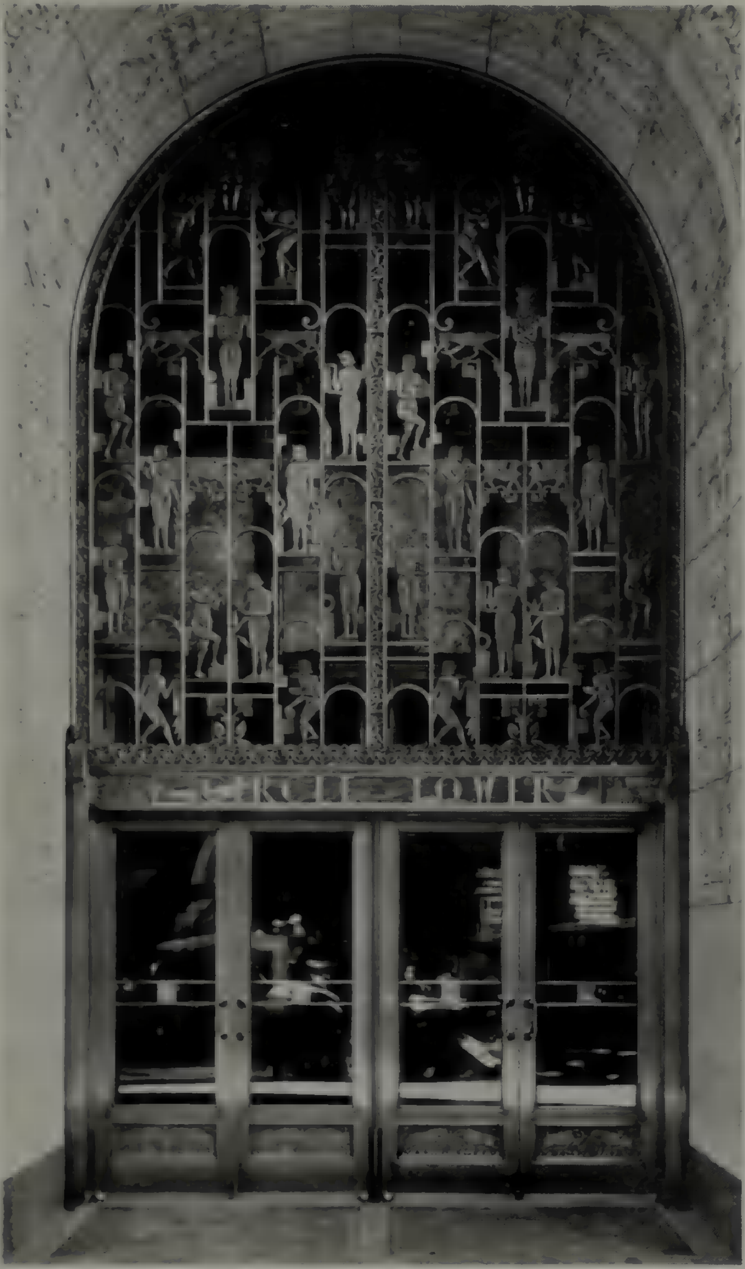
Armstrong's CUSTOM FLOORS

LINOTILE **CORK TILE**

MADE BY THE MAKERS OF ARMSTRONG'S LINOLEUM

ORNAMENTAL METAL IN THE FINEST BUILDINGS

Crafted by MICHAELS



Circle Tower, Indianapolis, Ind. Door, header and grille in soft Etruscon gold luster. Designed by Architects Rubush and Hunter. Made by Michaels Art Bronze Co.

INFINITE regard for the minutest details . . . plus sixty years of actual, intimate contact with the architect's plans and problems, gives Michaels' craftsmen an understanding mastery . . . seldom attained.

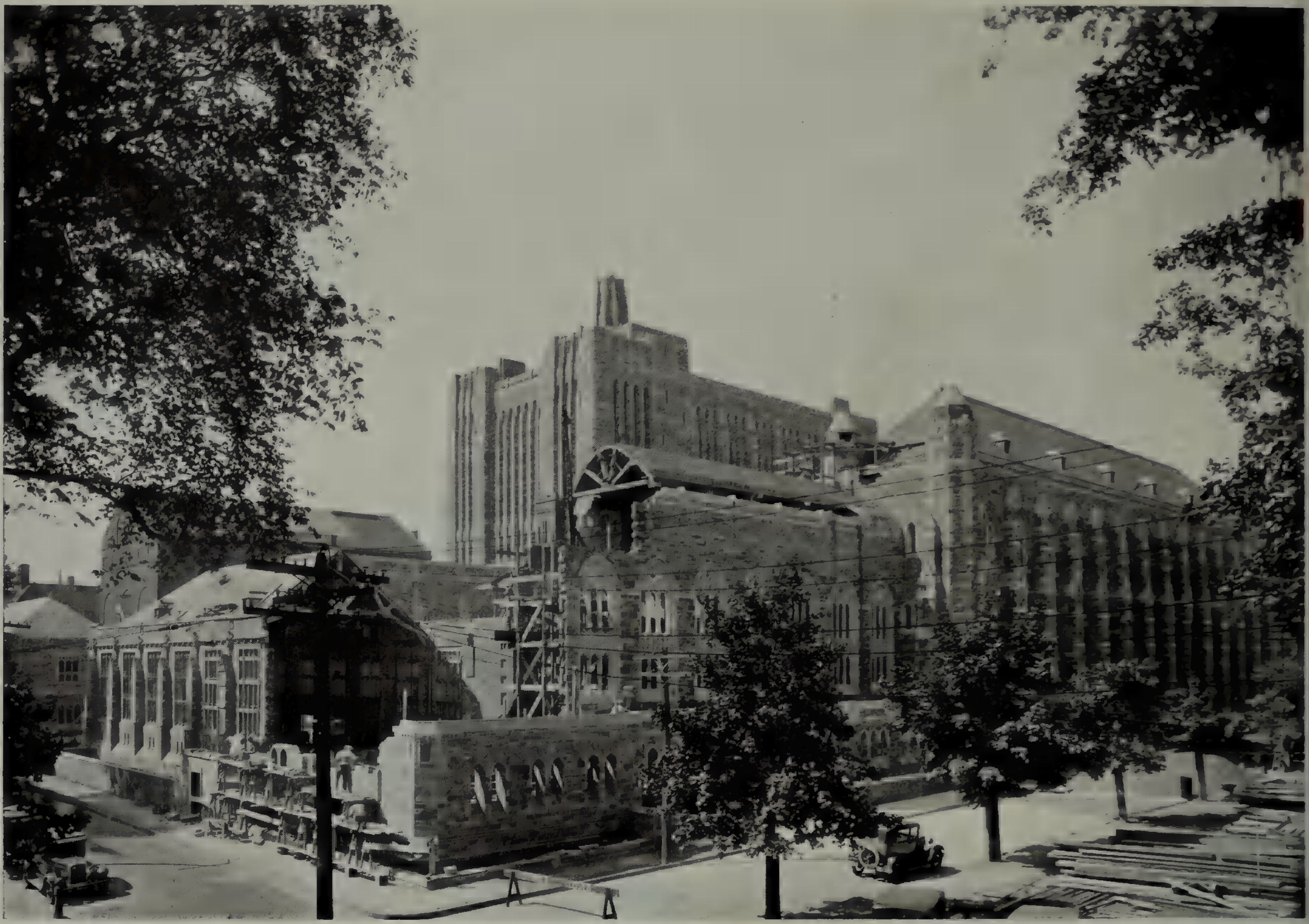
The finest banks, public and industrial buildings, homes, etc., boast of bronze, brass or iron work . . . Crafted by Michaels.

Michaels welded doors, extruded window frames and store fronts are architectural and engineering achievements. To help you with these details we have prepared, ready for blue-printing, complete sets of tracings in handy A.I.A. folders. A set will be mailed you on request. Write for your set today.

THE MICHAELS ART BRONZE CO.

Ornamental Craftsmen Since 1870

251-257 Court Avenue Covington, Kentucky



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BATES BROS. SEAM-FACE GRANITE CO., INC.
Quincy, Massachusetts

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Never before such a SPOT-STOPPER for painting on plaster

A NEW-TYPE, revolutionizing product! Not only a spot-stopping safeguard in painting on plaster, but a time and labor saver!

Seals the surface against moisture, lime, alkali and suction spots as no other material or product! "Holds itself out!" Will not even penetrate materials as porous as newspaper, yet "holds on" with never-let-go tenacity and adds elasticity to any finishing material! Cuts drying time between coats!

Velumina Wallhide

First Coater and Finishing Flat

Write for Booklet "Velumina Wallhide — the Great Spot-Stopper!"

Velumina Wallhide First Coater is usable under any flat wall paint! Seals against moisture, alkali, lime and suction spots as no other known product or material! Needs only six hours drying before recoating!

Velumina Wallhide Finishing Coat—tintable to soft, uniform tones with oil colors — seals spots skipped by first coater or where little knobs of plaster have broken off! Double-guards against trouble. Washable!

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Paint, Varnish and Lacquer Factories, Milwaukee, Wis. Newark, N. J., Portland, Ore., Los Angeles, Cal.

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Glass
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Lime Plaster adds distinction to the office of the President of the Northern Life Ins. Co., Seattle, Wash. . . . . A. H. Albertson and Associates, Architects.

For Quality and Economy in Plaster

ORNAMENTAL quality as well as economy in interior plastering depends on plasticity; and lime plaster is universally acknowledged to be unequalled in plasticity.

Experience has shown that where lime plaster is used, the operator can spread more plaster, and with less effort, since he is able to get a full arm swing back of his trowel. Also the slower rate of set of lime plaster permits the operator to rough in a larger area before having to stop to rod or screed; this fact not only enables him to cover a larger area of surface in the same length of time, but also permits more accurate work with less effort.

When cornices, mouldings, and mitres are to be run, and elaborate ornamental work to be cast and stuck, the relatively slow rate of set of lime plaster is greatly appreciated. It permits truer surfaces, sharp arrises, straighter and more perfect corners because the plasterer has plenty of time to manipulate his hock and trowel without fear of premature setting.

Lime plaster is highly porous and thus is an excellent insulator against heat, cold, and the transmission of sound. Its ability to absorb rather than to transmit or reflect sound has made lime plaster highly desirable for churches, theatres, and the finer types of apartments and residences.

The fact that lime plaster is not so hard or brittle as other plasters, and therefore is less subject to fissures and broken keys during readjustment and settlement of buildings, adds further to the value of lime as an enduring wall finish.

Rely on LIME
-tested by time

Comparative cost analyses have shown that lime plaster in place on the wall costs five to eight cents less per square yard than other plasters, a considerable factor in increasing plastering profits.

New Specifications giving definite classifications and requirements in accordance with latest approved practice are now available. Write today for your copy.

NATIONAL LIME ASSOCIATION

An organization of leading lime manufacturers formed to encourage a better appreciation of the economic value of lime in all its uses.

172-A

713 CARRY BUILDING • WASHINGTON, D.C.

From firesides to store fronts use "STAINLESS" for permanent beauty

As a building material, Stainless Steel has introduced a *beauty, permanence* and *strength* never before obtainable in commercial metals.

Rich, deep beauty so modern in its dark lustre . . . Resistance to corrosion, erosion, abrasion and rust . . . Toughness that is five times that of mild steel . . . What a wonderful avenue of progress it opens to the architect.

For Store Fronts, Screens, Doors, Trim, Fireplaces, Bolts, Nuts and Screws specify Stainless Steel. The modern trend toward the use of ornamental metals for office building walls inside and out points the way to lower up-keep costs, greater rentability and salability of structures, plus a permanence obtained only by the ancients.

Stainless Steel is obtainable in Brinell 150 to 600 and tensile strength 60,000 to 250,000 pounds per square inch . . . There is a type for every need . . . Our two booklets "Stainless in Industry" and "Stainless in the Home" will prove interesting to any forward looking architect . . . We shall be glad to mail them to you on request.

Genuine Stainless Steel is manufactured only under the *patents* of AMERICAN STAINLESS STEEL COMPANY . . . Commonwealth Bldg., Pittsburgh, Pa.

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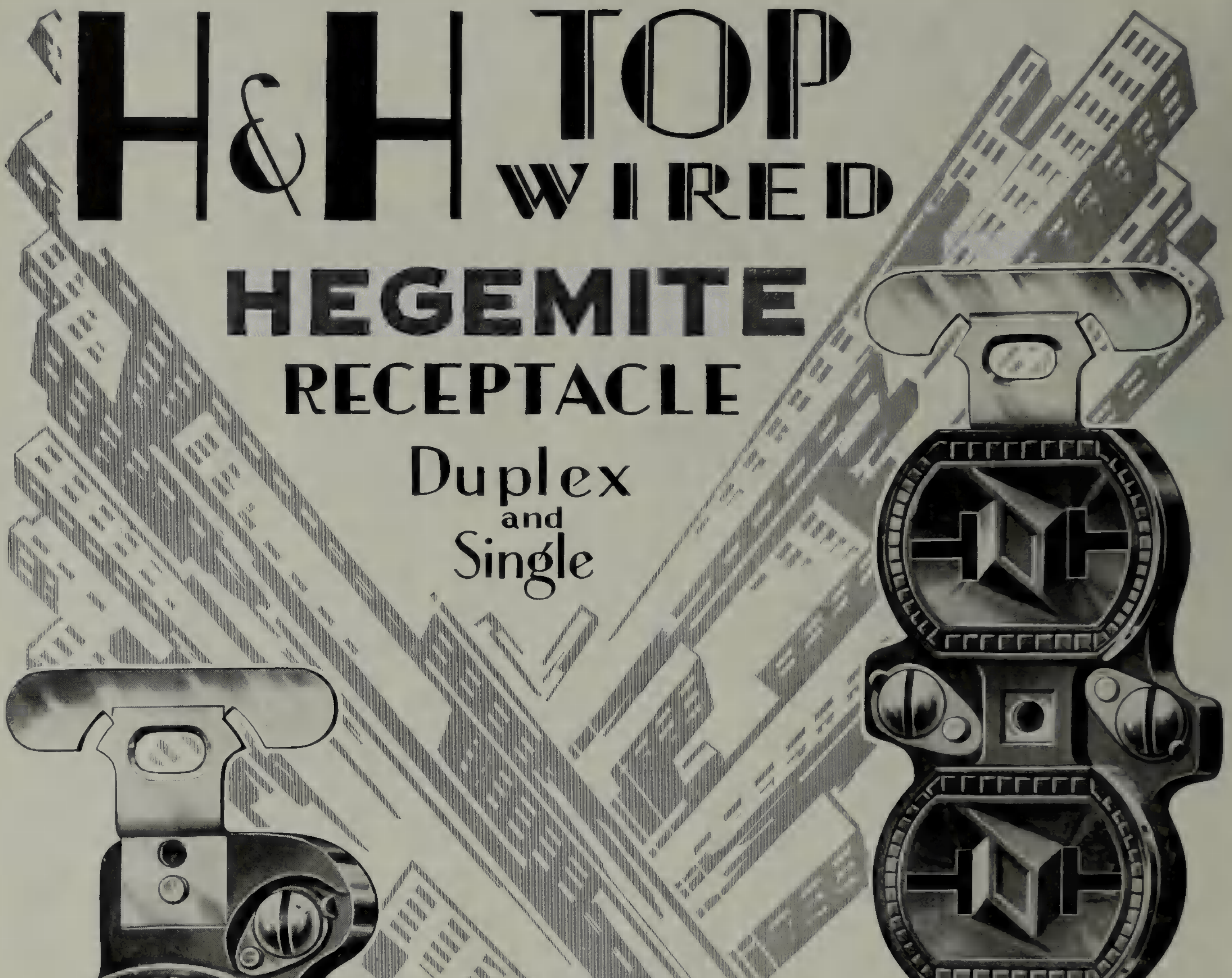
THE METAL OF ENDLESS POSSIBILITIES

STAINLESS STEEL



H&H TOP WIRED HEGEMITE RECEPTACLE

Duplex
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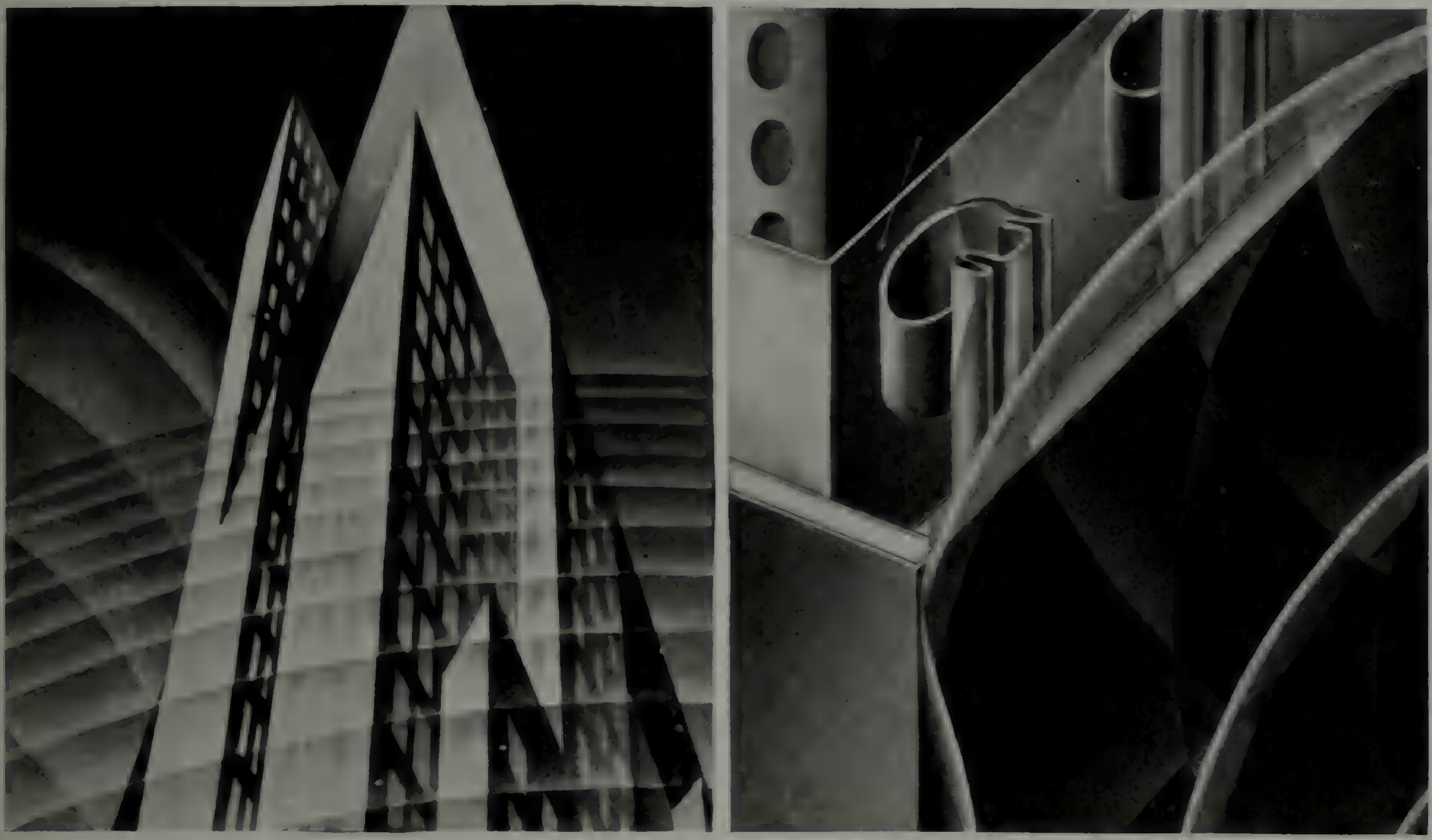
ONE-piece molded of brown phenolic compound—lustrous "HEGEMITE"; most sturdy, solid construction. With Finding Ridges which *find* the slots when plug prongs are pressed against receptacle-face. Puts a new *Convenience* into Convenience Outlets, plus the new convenience of top-wiring. Receptacles match perfectly your "HEGEMITE" Wall Plates with mat surface or art border. Blend neatly with brass plates finished to match interior color schemes . . . Specify No. 7725 for the Duplex; No. 7724 for the Single

HART & HEGEMAN DIVISION

THE ARROW-HART & HEGEMAN ELECTRIC CO.
HARTFORD, CONN. MAKERS OF ELECTRIC SWITCHES SINCE 1890

A MESSAGE TO ARCHITECTS FROM THE
UNITED STATES GYPSUM COMPANY



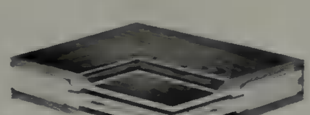
The left illustration shows noise vibrations crashing against the exterior of a building, like waves breaking on the seashore. At the right is a USG sound insulated "floating" partition which prevents similar sounds created within the building from being transmitted from one room to another.

You Are Invited to Use This Service in Architectural Acoustics

THE United States Gypsum Company has undertaken to supply a new and comprehensive service in the field of Architectural Acoustics. For this purpose we maintain a complete sound research laboratory and an extensive department devoted exclusively to the solution of problems in the field of sound control.

In order to handle all assignments in Architectural Acoustics it has been necessary for us to develop Acoustone, the USG Acoustical Tile for sound absorption, and in addition a complete System of Sound Insulation for preventing the transmission of sound from one room to another or from one floor to another.

The USG System of Sound Insulation is a scientific method of floor, wall, ceiling and door construction so designed as to prevent the force of sound striking on one side of the construction from carrying through to the other side. The United States Gypsum Company furnishes all the special materials required, supervises the entire installation and assumes full responsibility for the predicted performance of the installation. This system has been used with highly satisfactory results in hotel, apartment and office buildings, industrial plants, schools, studios, etc. It may be used in any construction where noise abatement is desirable.

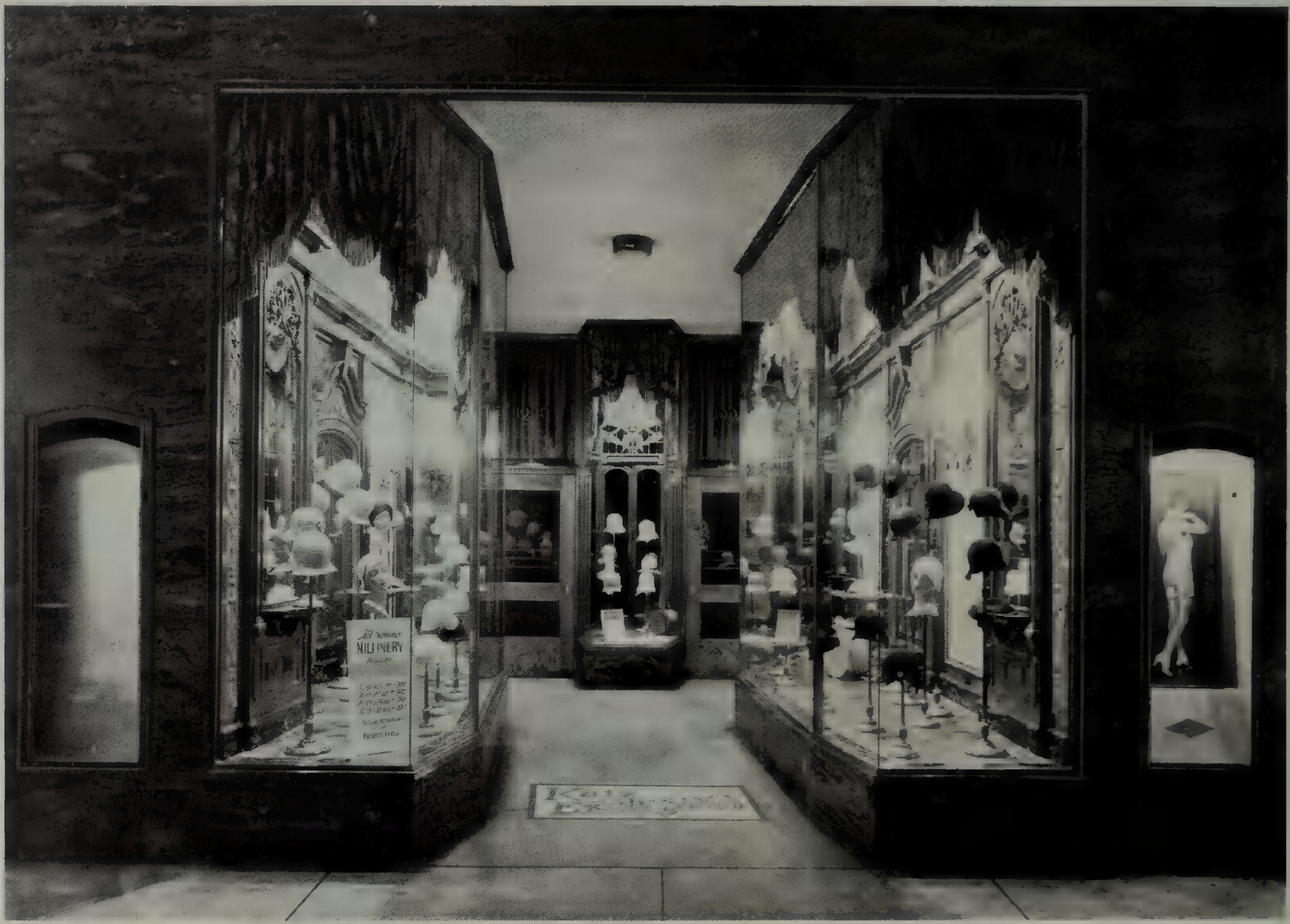


Detail of USG Sound Insulative Door which prevents the transmission of sound from room to room. It is used in connection with the USG System of Sound Insulation.

Architects are invited to write for particulars about the USG System of Sound Insulation and to avail themselves of our services on any problem in Architectural Acoustics. No obligation is involved. Address the United States Gypsum Company, Dept. 43K, 300 W. Adams St., Chicago, Ill.

USG SYSTEM *of* SOUND INSULATION

STORE FRONTS BY ZOURI



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WRITE FOR CATALOG

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HEADLEY Emulsified Asphalts consist of selected grades of straight steam-distilled Mexican asphalt in emulsified form. In the process of manufacture, the asphalt is finely dispersed, all of the minute particles being individually enclosed within a soapy film which prevents them from coalescing or sticking together when in emulsion form. The asphalt particles are completely and uniformly dispersed and remain so until the emulsion is applied.

On application, the film of soapy solution enclosing each asphalt particle quickly breaks, due to physicochemical changes and evaporation of the water, and the asphalt particles then unite to form a uniform continuous coating of pure asphalt, thus assuring perfect bond and permanent protection.

Standard grades with differing characteristics afford a choice for various requirements.

Only HEADLEY EMULSIFIED ASPHALTS combine these advantages

High quality and quantity of straight steam-distilled Mexican asphalt (70% Asphalt content by weight).

Small amount and advantageous nature of the soap-type emulsifier.

Low water content (Not over 30% by weight).

Cold application (at temperature above 35° F.) by flowing, spraying, brushing or squeegee. No heating kettle, skilled workmanship or tedious mopping required.

Perfect bond to any clean surface, wet or moist, assuring complete protection.

Not injured by freezing.

Used alone for film coating, or in conjunction with fabric membranes for built-up membrane protection.

Freedom from mineral suspending agents and inert fillers. No ingredient impairs ductility, bonding or imperviousness of the finished coating.

Useful properties fully retained. No beneficial physical properties of the asphalt are impaired or permanently lost as when asphalt is dissolved by a "cut-back" process, or mixed with fillers that have no protective qualities.

Not "reversible" after thoroughly drying.

Very stable. Long storage produces no appreciable sedimentation or separation.

No flammable or toxic fumes. No dangerous solvents to evaporate and create fire hazard and endanger health in unventilated locations.

Odorless and tasteless. No contamination of food, water, etc., in refrigerators, tanks, etc.

Efficient and permanent. Apply uniformly, set readily, dry in a few hours and thereafter thoroughly resistant to temperature changes, water, acids, alkalies, etc. The finished coating remains continuous, elastic and will not crack, creep or flow under ordinary exposure conditions.

High asphalt content and resistance to destruction by freezing are outstanding exclusive features of Headley Emulsified Asphalts.

Principal Uses

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Protection of concrete and masonry against disintegration.

Protective coating of concrete, masonry, structural steel, pipe lines, metal, etc., against the destructive influences of fresh and salt water, moisture, gases, chemical fumes, brine, acids and alkalies, etc.

Bonding and cementing bituminous flooring, linoleum, plaster, stucco, tiles, blocks, slabs, bituminous bridge and crossing planks, fibrous and mineral wall boards, cork board and other insulation, etc.

MAIL THE COUPON FOR LITERATURE

Bulletin 330 and Specifications covering standard applications will be mailed on request, and our Research and Development Department will co-operate in connection with new or exceptional uses.

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Emulsified Asphalts for Industrial Uses
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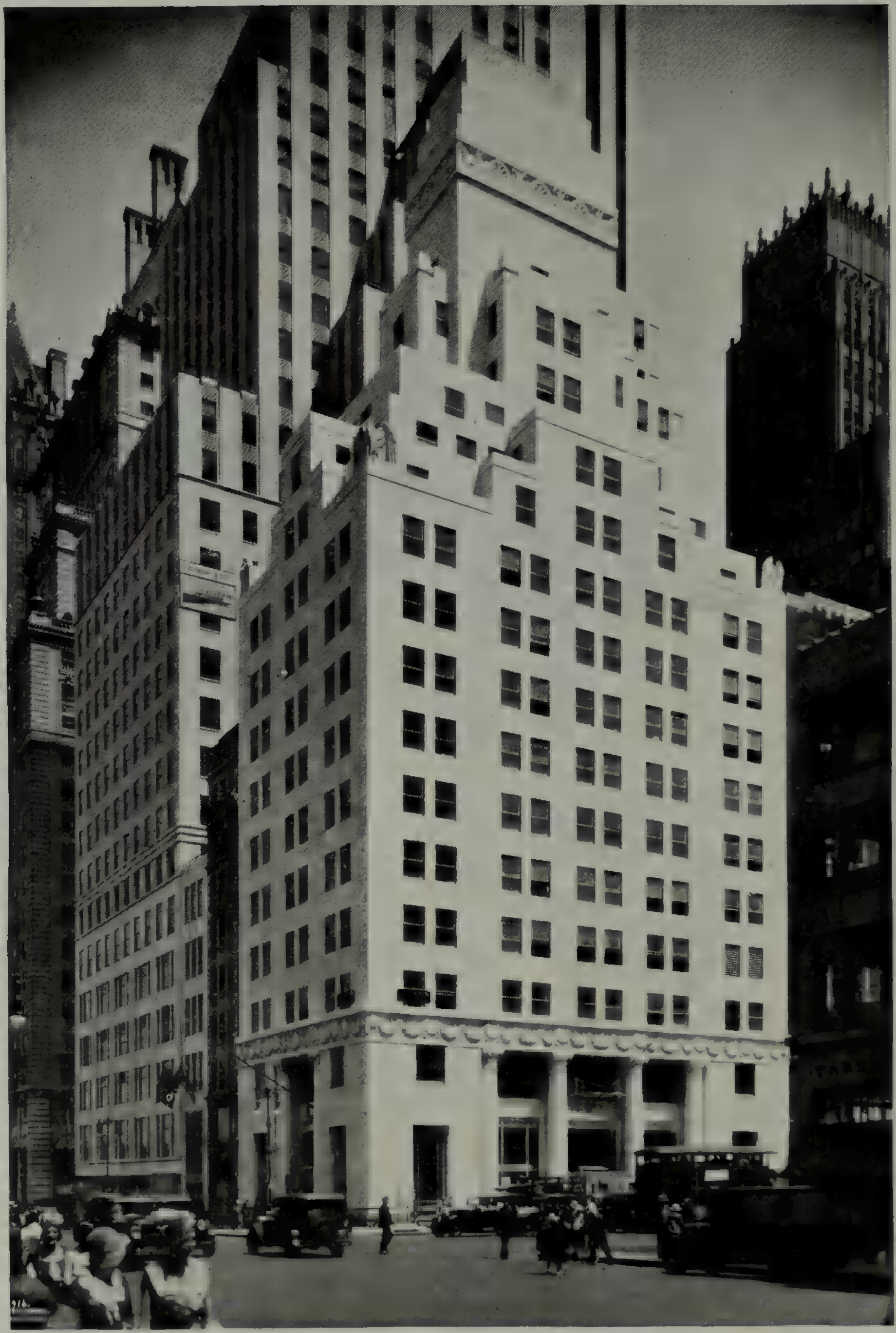
GEORGIA MARBLE



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Cross & Cross, *Architects* Thompson Starrett Company, Incorporated, *Builders*
Georgia Marble furnished by Domestic Marble and Supply Company, N. Y.

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ARCHITECTURAL AND ALLIED ARTS EXPOSITION

UNDER THE AUSPICES OF
THE AMERICAN INSTITUTE OF ARCHITECTS
THE ARCHITECTURAL LEAGUE OF NEW YORK
WITH THE ENDORSEMENT OF
THE SOCIETY OF BEAUX-ARTS ARCHITECTS
THE NEW YORK BUILDING CONGRESS
APRIL 18 - APRIL 25, 1931
GRAND CENTRAL PALACE, NEW YORK

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ANNOUNCEMENT

The Fourth Biennial Architectural and Allied Arts Exposition will mark an important epoch in architectural history as it will commemorate the Fiftieth Anniversary of the founding of the Architectural League of New York. Fifty years of service—during which time American architecture has had its greatest development.

The exposition will furnish an exceptional educational opportunity to the public by establishing under one roof a visual contact with the latest devices and materials entering into the construction of the home and its decorative embellishment. This unique exposition will be correspondingly instructive to the building trades and the technical professions, tending to develop a better understanding through the creation of an opportunity for a thoroughly comprehensive survey of the latest and most up-to-date appliances which the Manufacturers of America have created and placed at the disposal of the building industry.

In view of the general interest and educational stimulus which such an exhibition must encourage and foster, representing as it does the superlative expression of the fine arts on one hand, and their practical application to the every-day life of our people on the other, the general interest in the Architectural and Allied Arts Exposition will be far-reaching in its effects. Because of the increased appreciation certain to follow this display of vital inventive and constructive elements presented by the manufacturers and builders of modern times, tending toward the improvement of taste and the development of better and more beautiful buildings throughout the land, it is anticipated that the responsive cooperation of exhibitors will be spontaneous. It is felt that this enterprise representing the combined effort of Art and Industry, will be of the greatest inspirational influence throughout the whole country.

Raymond M Hood
President,
The Architectural League of New York.

FIFTIETH ANNIVERSARY
1881 THE ARCHITECTURAL LEAGUE OF NEW YORK 1931
FIFTY YEARS OF SERVICE

The *only* Fire Door Closer with Underwriters' approval for use on self-closing fire doors NORTON

Style No. 1

FOR use on fire doors that swing on hinges, the Norton Fusible Link Door Closer automatically closes the door when a temperature of 160 degrees Fahrenheit is reached.

Equipped with an auxiliary spring and hold open arms, the NORTON has increased closing power when the link fuses, thus assuring that the door will be held firmly against heat expansion, as well as swift closing action.

The NORTON is designed to hold the door open at about 100 degrees, and to use only ordinary spring power in the regular operation of the door. The NORTON fusible Link Door Closer, Style No. 1, is the only door closer with the approval of the National Board of Fire Underwriters Laboratories for use on automatic self-closing fire doors. Write for specifications.

See Sweet's Pages B2408-2412

NORTON DOOR CLOSER COMPANY
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NORTON DOOR CLOSERS

THE STERICK BUILDING, MEMPHIS, TENN.

Wyatt C. Hedrick, Inc., Architect, Fort Worth, Texas
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MEMPHIS, Tenn., can be justly proud of the recently-erected Sterick Building at Third and Madison Streets, one of the South's outstanding buildings. The interior surfaces — floors and trim — are enhanced and protected by the use of "61" Floor Varnish and "38" Preservative Varnish which possess maximum service qualities, as many architects, painters and owners know from long experience. What aid may the nearest P&L Architectural Service Department render you?

PRATT & LAMBERT-Inc., 108 Tonawanda Street, Buffalo, N. Y. (Phone Delaware 6000); 3301 38th Avenue, Long Island City, N. Y. (Phone Stillwell 5100); 320 West 26th Street, Chicago, Ill. (Phone Victory 1800). Canada: 28 Courtwright Street, Bridgeburg, Ontario.

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LEADING DIRECTLY OFF THE STREET—

But Non-Slip in Any Weather

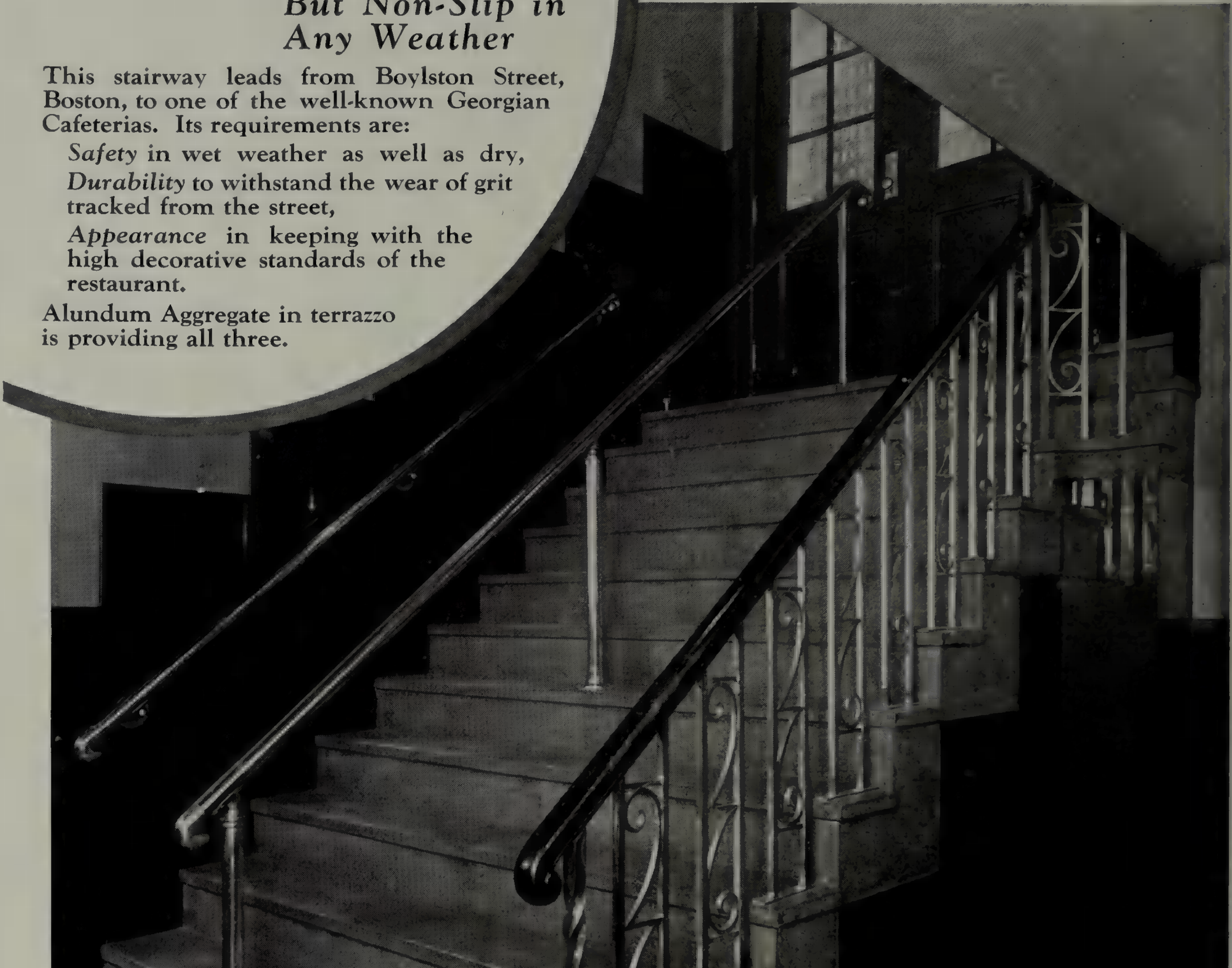
This stairway leads from Boylston Street, Boston, to one of the well-known Georgian Cafeterias. Its requirements are:

Safety in wet weather as well as dry,

Durability to withstand the wear of grit tracked from the street,

Appearance in keeping with the high decorative standards of the restaurant.

Alundum Aggregate in terrazzo is providing all three.



NORTON FLOORS
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NORTON COMPANY, WORCESTER, MASS., NEW YORK, CHICAGO, DETROIT, PHILADELPHIA, PITTSBURGH, CLEVELAND

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FRITTED GLAZE
VITRITILE

OPENS NEW FIELDS IN COLOR COMPOSITION AND HARMONY

LOVELY cream tans and cream browns, beautiful luminous matt whites, lively midnight blacks, open new fields of color design to the architect. Natco Fritted Glaze Vitritile, with its wide range of harmonious color combinations lifts from the architect, in the construction of interior and exterior walls, the color restrictions that practical considerations heretofore imposed.

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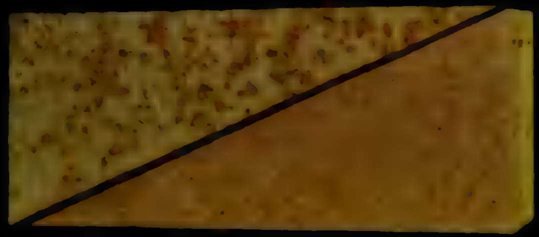
Natco Fritted Glaze Vitritile is made by a special process which represents a triumph of the ceramic art. The added care, the added cost of this exacting method bears fruit by giving a glaze the equivalent in beauty and permanence of that of the finest English Glazed Brick. Inside or out, the glaze is immune to dirt, grease, chemicals, and the attacks of the elements. It is easily cleaned and kept clean, assures that the structure will stand as a permanent and beautiful tribute to the skill of its designer.

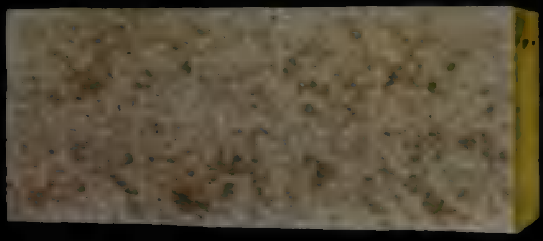
If you have not received literature giving complete information on this outstanding new development, please write at once, and it will be sent you.

8530-L & 8530-S



8520-L & 8520-S

8515-L



8535-L

8510-L

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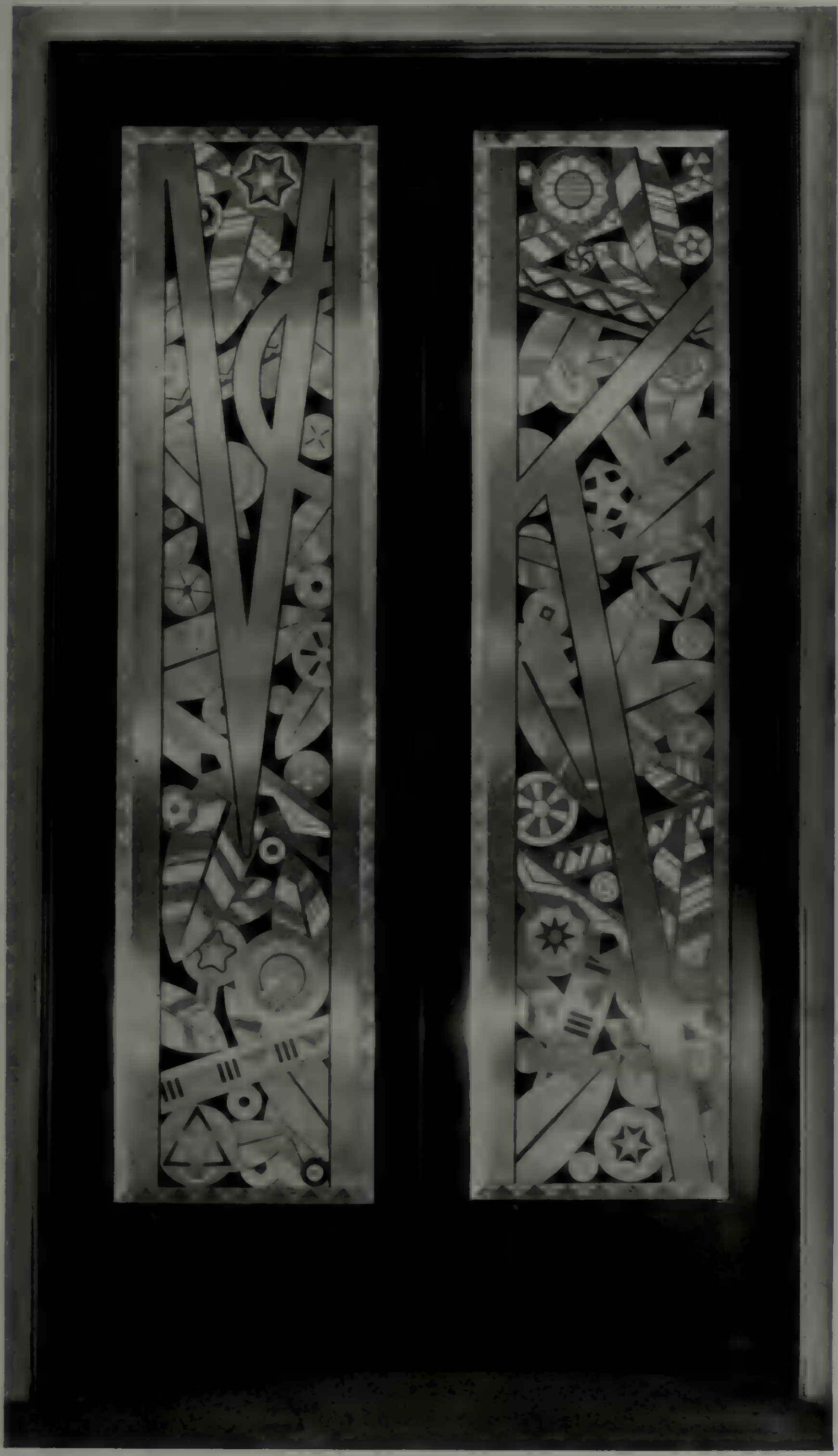


Specify THORP DOORS

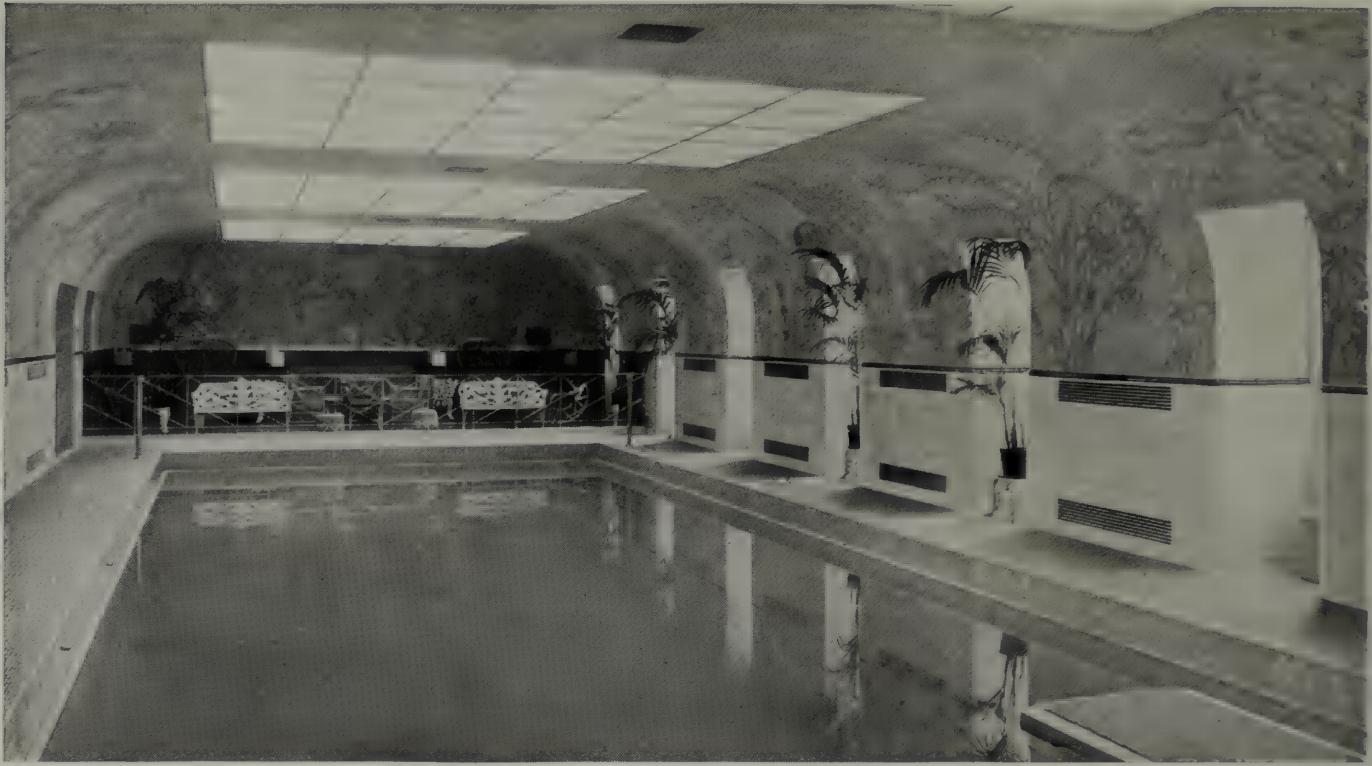
●

This strikingly modern elevator enclosure in the McKnight Building, Minneapolis, was designed by Hewitt and Brown, Inc., Architects. The design is worked out in etched nickeled silver on a black background

●

The far-sighted owners of the McKnight Building believe in keeping pace with the competition of newer structures. Realizing that the lobby gives the most important impression of the building, they had Hewitt and Brown, Inc., design new elevator enclosures for the ground floor. The Thorp Organization made the doors with their usual skill and attention to the architects' specifications. The resulting effect imparts a new atmosphere to the entire building.

THORP FIRE PROOF DOOR COMPANY MINNEAPOLIS, MINN.



Architect: JOHN RUSSELL POPE—Tile Contractors: DePAOLI DEL TURCO FOSCATO CORP.

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in New York, is a study in lights and shadows...like a sheltered pool in a tropical Utopia...a decorative masterpiece achieved by John Russell Pope, with Robertson Planatile and Chromatex. The pool and the runway are of Robertson Chromatex...non-slip, impervious and easily cleaned. The wainscot treatment in a characteristically feminine pink is accented with one of Robertson's latest innovations, the setback cap glazed in silver. This is an ideal combination for such an indoor pool. Supplementing Robertson's Planatile and plain tile with Chromatex offers the architect many possibilities for originality. Chromatex is available in a wide range of colors and textures. The finest and largest swimming pools in famous institutions are made of Robertson Tiles . . . also many smaller pools in private homes. From the first tiled pool in America to the most costly in New York is the spread of Robertson's experience, and these facilities are offered to architects in the development of any swimming pool project. Descriptive literature is available for your files. Special information on request.

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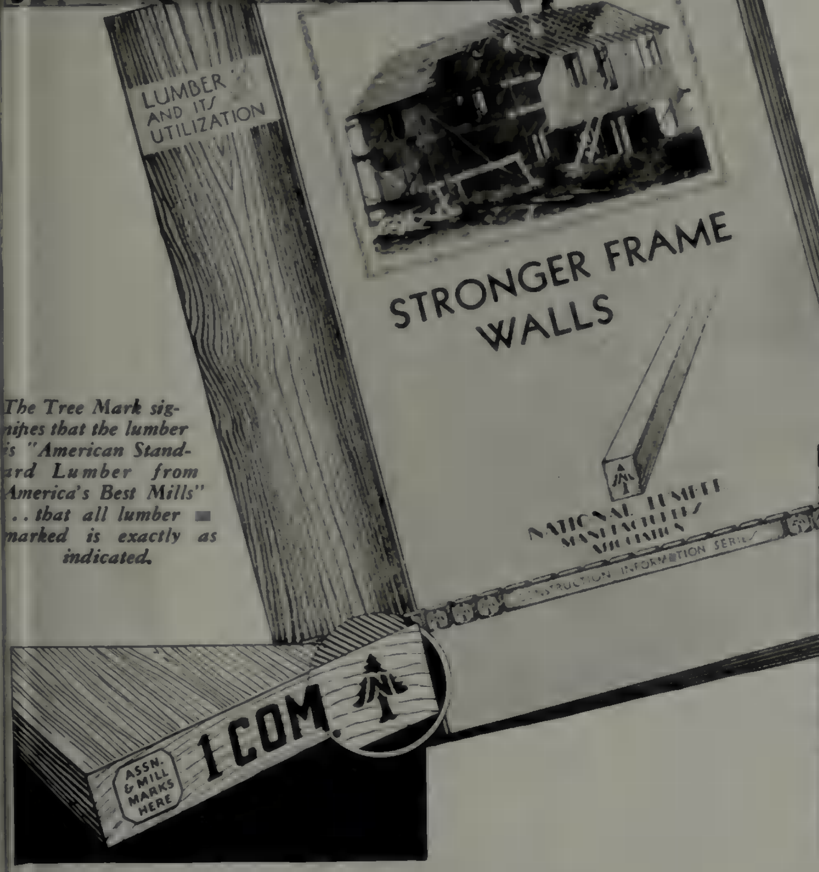
The National Lumber Manufacturers Association, sponsor of Tree Mark lumber that is guaranteed to be exactly as stamped by the expert grader, will send, on request, a free copy of this amazing booklet. Mail the coupon today.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Concrete pays tribute to fine architecture

CONCRETE, in many forms, has been skillfully employed by the architect in designing this home. The exterior walls are of concrete masonry units, in slightly irregular sizes and varied colors. Building frame and floors throughout are of reinforced concrete—*one unit,* of utmost strength and rigidity. The roof is attractively tiled. So constructed, a home is *firesafe* and long enduring.

The views on this page are of a home that is distinguished in both architecture and construction—the home of Robert B. Henderson, in Hillsborough, California. Gordon B. Kaufmann, Los Angeles, Architect; Dowsett-Ruhl Company, San Francisco, Contractors

PORTLAND CEMENT *Association*

Concrete for permanence and firesafety

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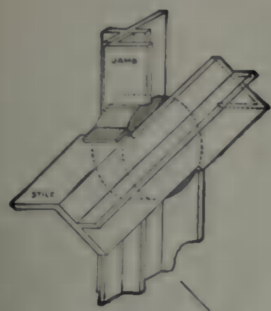
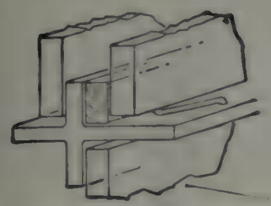
CHICAGO

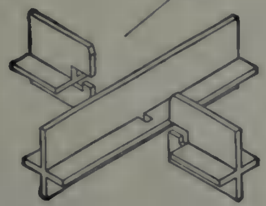
Mark well these outstanding and exclusive facts regarding the one and only sash fabricated of genuine wrought iron. Sash, for the first time, replete with special advantages of design overcoming all faults common to metal sash as previously known. Achieved through the employment of the remarkable structural possibilities presented by the Mesker cruciform rolled bar in a metal having as an historical characteristic exceptional resistance to the corrosive factors commonly present where extra heavy duty sash is required. An especially vital point—the pivot—is here done in white brass and malleable iron in cup style. Freedom from weaving—smooth, positive hinge action during the life of the building!



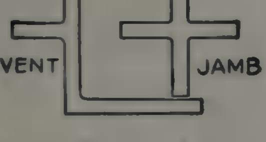
A triumph in pivot design.



The remarkable cruciform bar permits inside, outside or double glazing.



All joints are made mechanically true and fast then electrically welded.



Unique all-around double contact jamb section.

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3. *Marine Biological Laboratory, Woods Hole, Mass. Architects: Coolidge, Shepley, Bulfinch & Abbott, Boston. Electrical Engineers & Contractors: Hixon Electric Co., South Boston.*
4. *McKinlock Hall, Harvard University. Architects: Coolidge, Shepley, Bulfinch & Abbott, Boston. Electrical Engineers & Contractors: Hixon Electric Co., South Boston.*
5. *Langdell Hall, Harvard Law School. Architects: Coolidge, Shepley, Bulfinch & Abbott, Boston. Electrical Engineers & Contractors: Hixon Electric Co., South Boston.*

THEY all go together. Note the type of educational institutions illustrated. These, recently constructed, are all "Bryant Equipped", for in such buildings, as in commercial buildings, homes, hotels, hospitals, manufacturing plants, proper lighting and the proper control of lighting are now considered of paramount importance. In Boston, as in most cities, you'll find that the architects and engineers responsible for the more notable buildings have specified and insisted upon the use of Bryant switches, receptacles and other wiring devices.

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If you have not received a copy, write us for it.

A:10

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Architect—W. Hankin, Trenton, N. J.

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● To the right is shown the patented Lewis Humitrol. Looks like a thermostat, acts like one. You merely set this Humitrol for the relative humidity you wish to maintain. The entire operation of the Lewis Air Conditioner is governed by this control. Humidity is regulated as completely and automatically as is temperature by the use of a thermostat. Full Humitrol details upon request.

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THE necessity of supplying additional moisture to heated air during the winter months is no longer debated. Simply adding moisture, however, does not solve the problem. Diffusion of this moisture is necessary. The recirculation of air must be considered. The air washing factor must not be overlooked. If an ideal, effective temperature for the promotion of health and comfort is to be maintained, the production of humidity must be placed under as positive control and within as close a range as that of heat.

Lewis Air Conditioners produce humidity in a vaporous, gaseous form—thus diffusion is rapid and complete. No free particles of moisture are discharged into the air. Recirculation is assisted. All air is washed in passing through the humidifying section of the various units. Most important is the patented Lewis Humitrol which places the production and maintenance of any desired relative humidity under positive control. The Lewis Humitrol used with Lewis Air Conditioners regulates humidity *accurately* and *positively*.

Lewis Air Conditioners are used with hot water or steam heating systems. A special, low priced, non-motorized unit (illustrated above) has been perfected for steam heating systems. Other models are equipped with silent motor and fan. Cabinets housing Lewis Air Conditioners are of selected woods or of fine furniture steel finished in grain and color to harmonize with interior finish. Units may be concealed in the wall to conform with modern concealed radiation or may be located in the basement.

A booklet "Controlled Humidity and Human Comfort" pointing out the advantages of air conditioning, together with full details describing the several Lewis Air Conditioners will be sent gladly upon request. The Lewis Corporation, 813 Second Ave. So., Minneapolis, Minn.

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Where special fixtures are required, Union Metal craftsmen work from the architect's rendering and promise a faithful reproduction of the original conception.

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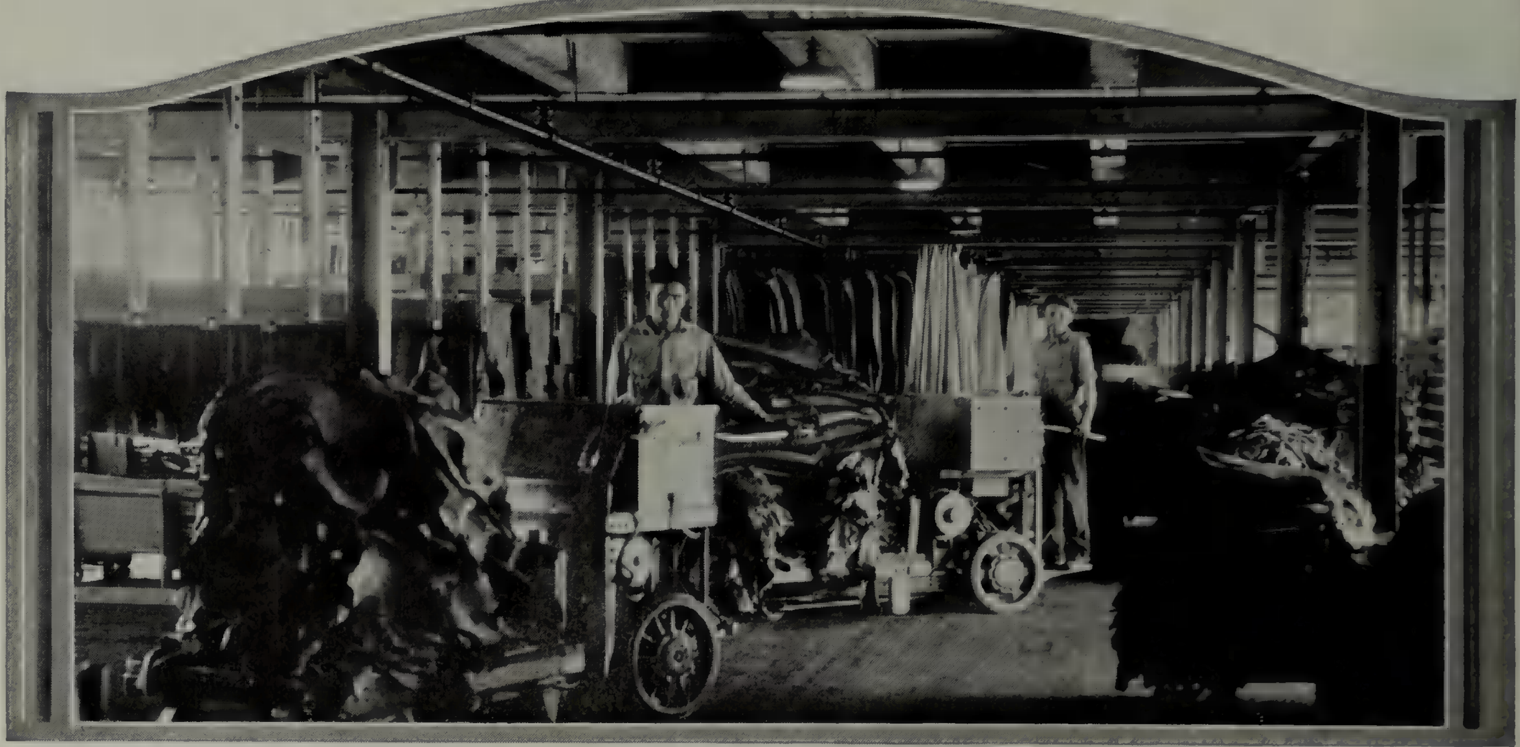

A Trucking Floor of "Table-Top" Smoothness

The photograph above shows a Bloxonend Floor in the main finishing loft of the Elkland Leather Company, Elkland, Pa. Area --- 15,000 sq. ft. laid over a sub-floor of 2-in. splined fir plank. This BLOXONEND order resulted from a test installation laid two years before.

The irregular shape and size of hides transported on lift trucks makes secure stacking difficult. To permit capacity loading without danger of spillage and delay (due to vibration) a floor of "table-top smoothness" was required. *Durability* was also a requisite to withstand continual trucking.

BLOXONEND FLOORING is as accurately milled and scientifically kiln-dried as the wood used in the finest pianos. Sanding is *not* necessary to bring it to a smooth surface. Shrinkage or expansion negligible. No tar or pitch binder used.

Dovetailing small blocks of Southern Pine endwise onto 8-ft. baseboards --- and laying with splines and nails (exclusive with BLOXONEND) insures *lasting smoothness.* That is one of the reasons hundreds of leading industrials have found it profitable to pay a higher first cost for BLOXONEND. Write for Architectural Specifications.

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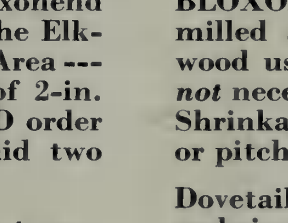
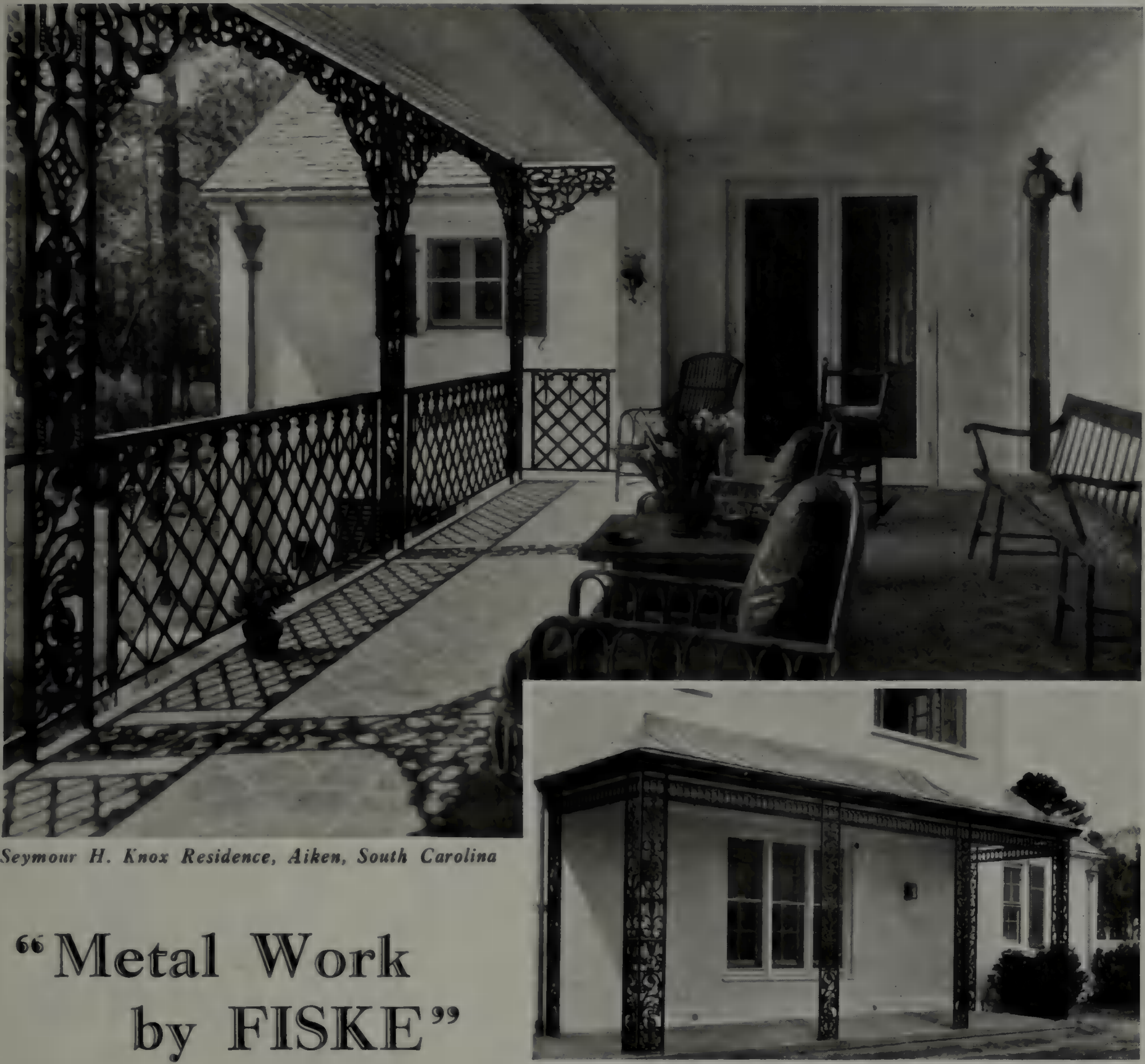


Bloxonend is made of Southern Pine with the tough end grain up. It comes in 8 ft. lengths with the blocks dovetailed endwise onto baseboards

Lays Smooth
Stays Smooth

Bloxonend is widely used in shops and gymnasiums of finer type schools



Seymour H. Knox Residence, Aiken, South Carolina

Peabody, Wilson & Brown, Architects

"Metal Work by FISKE"

THE Seymour H. Knox residence at Aiken, S. C., is one of many luxurious homes throughout the United States where the ornamental metal fittings have been executed by FISKE. The preference for FISKE is constantly growing among architects and especially among architects whose specifications always call for the *finest*. For they realize that to specify "metal work by FISKE" is to specify the *finest* in workmanship, materials and perhaps what is even more important—over 70 years of experience in close cooperation with architects and builders.

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80 Park Place ~ New York
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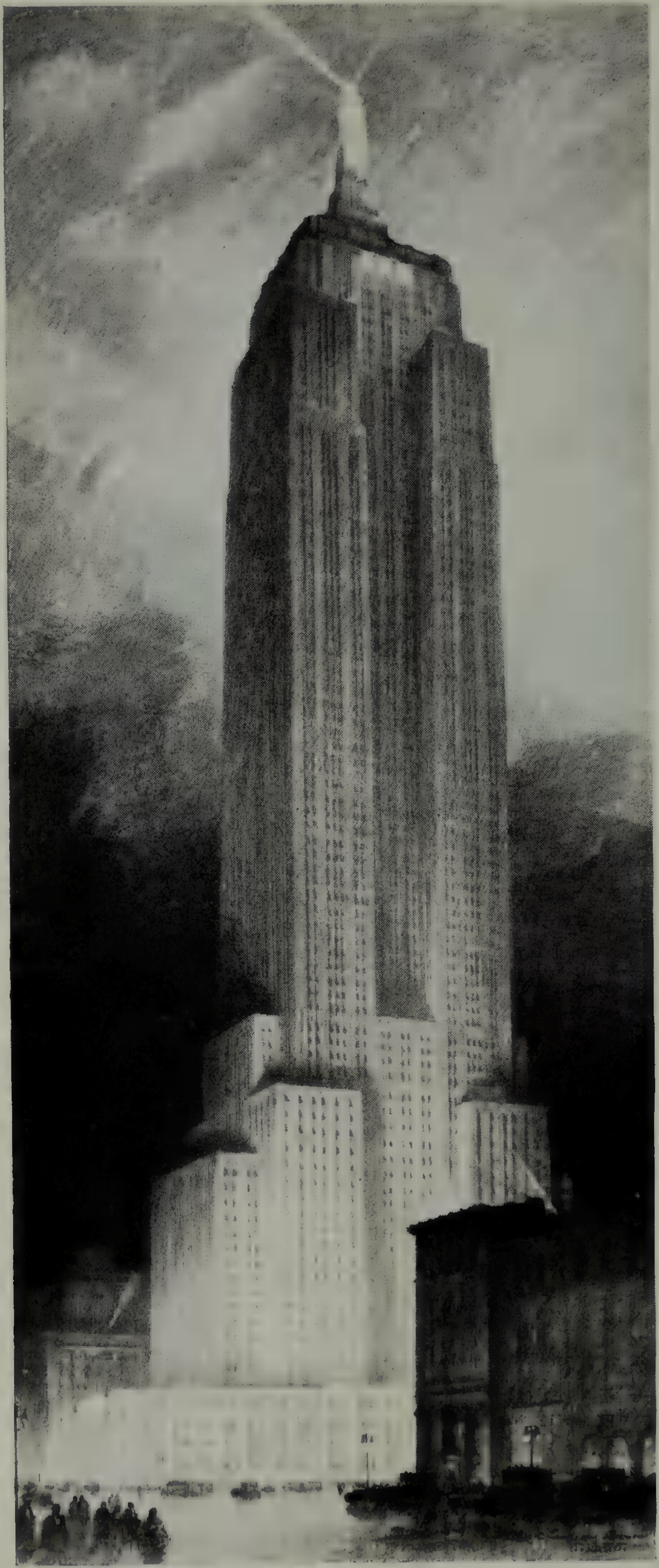
SPECIALISTS IN ORNAMENTAL METAL WORK



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This structure is on plot of 200 feet by 425 feet. Height from sidewalk to main roof 1050 feet,—85 stories,—Plus observation tower of 200 feet, making total height of 1250 feet.

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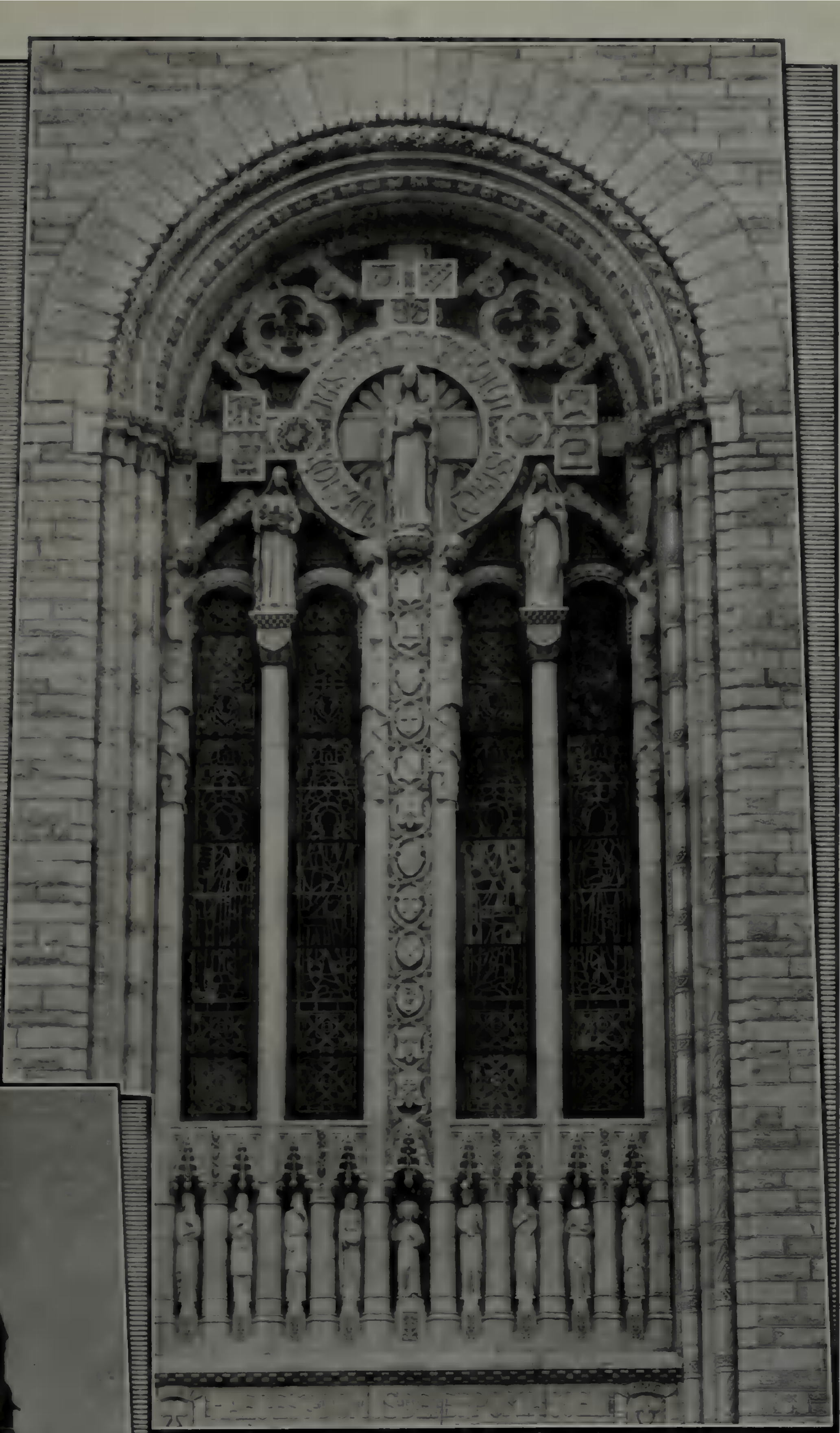

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- **THE CAST STONE INSTITUTE**
- 33 W GRAND AVENUE, CHICAGO, ILLINOIS

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Write for LUSTRAGLASS BOOKLET A-430 and SPECIFICATION SHEET . . . SEE the complete table of ultra-violet ray transmission, then keep this literature in your file to show your clients.

*Send for LUSTRAGLASS BOOKLET A-430 and see complete table of transmission . . .

An unretouched, "end on" photo of four leading makes of glass. The white one is LUSTRAGLASS . . .

[illegible] days growth of Tomato Plant under (1) LUSTRAGLASS (2) ordinary window glass.

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Farmers Bank Building **Pittsburgh, Penna.**

ORIGINALITY *—in a medium that encourages* ORIGINALITY

The adaptability of Sealex materials to interior decoration is well illustrated by this office reception room of the Walker Gordon Milk Co., New York City. That the unique Sealex floor was designed-to-order is unmistakable.

We think there is something at once challenging and inspiring about these pictures. You can't look at them for long without wanting to reach for [illegible] pencil and sketching paper. You feel an itch to try your hand at designing a floor or two of your own.

All right, go ahead. The only thing to remember is that *there are no rules.* No blue-laws. No inhibitions.

Because you are working in the world's most "workable" floor material. A sharp linoleum knife in the hands of [illegible] skilled mechanic can make *Sealex* Linoleum or *Sealex* Treadlite Tile as-

(Continued [illegible] following page)

Modernistic floor of Sealex Linoleum above is carried out in Black, Dark Gray, Light Gray, Terra Cotta, and Green. A standard design for the chain of showrooms of the Skel-Gas Co

Unusual kitchen floor design in Sealex Treadlite Tiles of several colors:—Mahogany Brown, Craft Brown, Fawn Gray and Colonial Buff.

An illustration of the effective [illegible] of [illegible] cut-to-order inset. Judicial placement of insets makes [illegible] pleasant departure from monotony.

BONDED FLOORS

Materials for Bonded Floors are manufactured by Congoleum-Nairn Inc.

(Continued from preceding page)

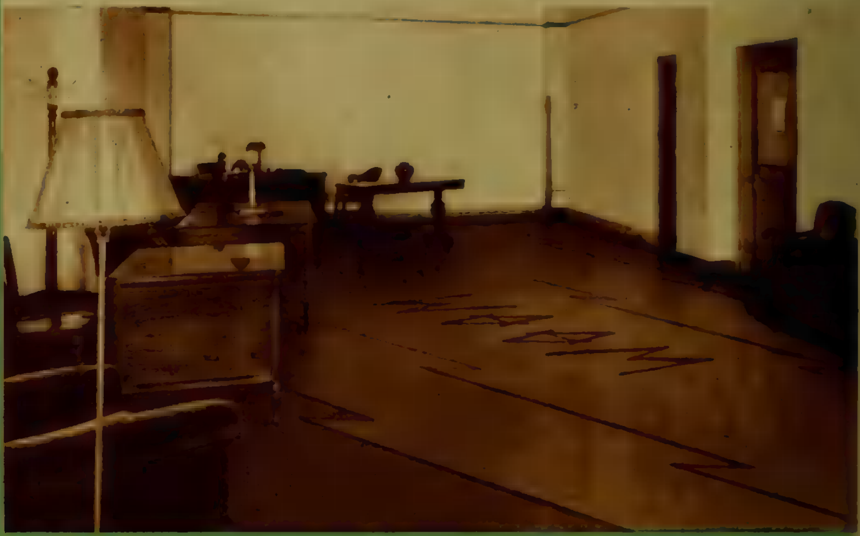
sume almost any two-dimensional form your mind can conceive.

So reach for that pencil and paper. The sky's the limit. Plan a modernistic floor for a smart shop. An office floor with the firm's trade-mark as part of the design. A formal "period floor" for a public building. A living room floor with the owner's hobby symbolized in the floor design.

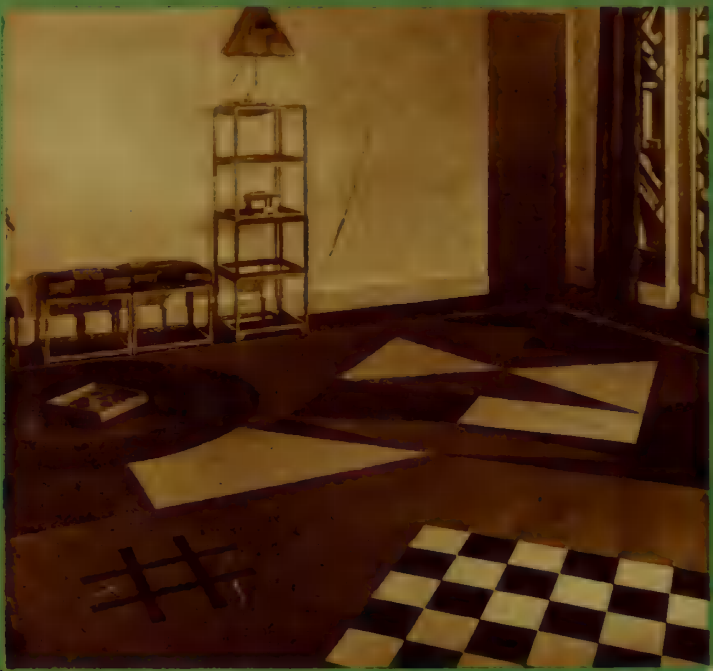
And when the time comes to carry out your conceptions, call in an Authorized Contractor of Bonded Floors. Those firms, as you can see by these pictures, have had specialized experience in this type of work. And their standards of workmanship are so high that we are able to back their floors with Guaranty Bonds against repair expense!

CONGOLEUM-NAIRN INC. *General Office:* KEARNY, N. J.

BONDED FLOORS



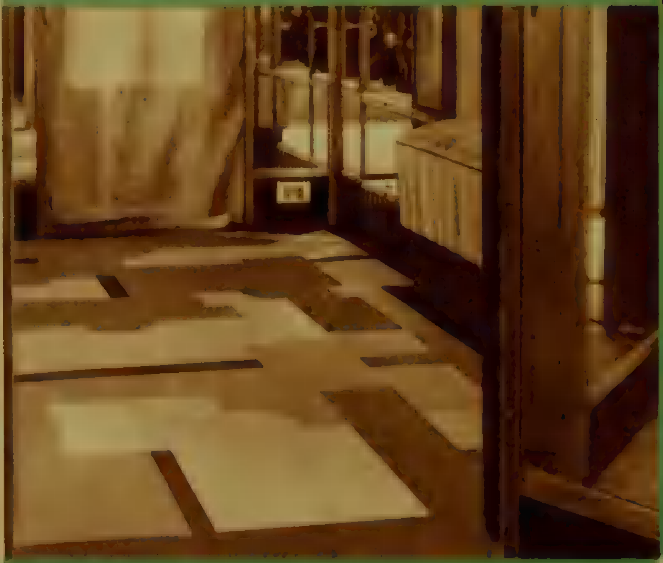
Floor design reflecting the character of a business. Reception room of Radio Station WAAM, Newark, N. J. Letters WAAM were cut from Sealex Linoleum and inset into the floor.



An unusual type of game-board and floor combined, illustrating the versatility of Sealex flooring materials from a design standpoint.

●

If, rather than prepare floor designs in your own office, you wish suggestions submitted to you, an Authorized Contractor of Bonded Floors will place his and our services at your disposal. Call upon us for estimates, specifications, samples or designs. No obligation, of course . . . .



A modernistic dressing room floor in a custom-made design, cut-to-order from several colors of Sealex Treadlite Tile.

SEALEX
LINOLEUM

Defining the true meaning of the word "chic"

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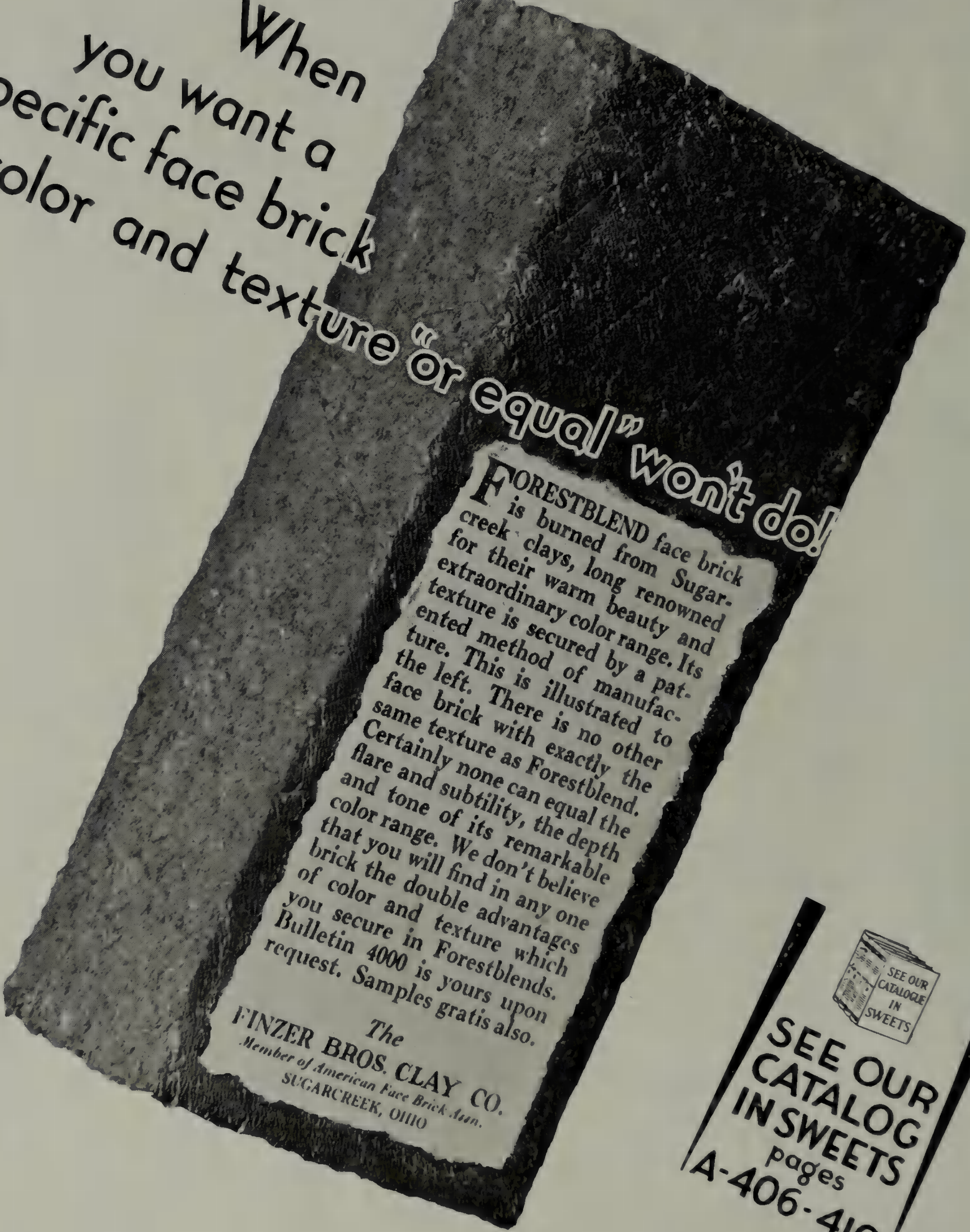

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Statler Hotels : Buffalo, N. Y., Cleveland, Ohio, Boston, Mass.

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Ph. Lindsley Small, Cleveland, Ohio . . . Architect

WHEN HEAT IS Controlled

. . *working conditions are right*

H E A T   W I T H   U N I T   H E A T E R S

Venturafin Units can be mounted on wall, column or ceiling with ordinary ¾-inch hanger pipes. Heat control with Venturafin Units becomes automatic by the application of a Mercoid Thermostat.

It is easy to maintain an even temperature—not too hot, not too cold—throughout a building . . . to keep workers comfortable and contented, after Venturafin Unit Heaters are installed and heat becomes *controlled.*

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Venturafin Units are ideal for heating factories, shops, stores, garages, and many other types of buildings. They are easy to install and can be used on high, medium or low pressure steam applications. We shall be pleased to furnish you complete data direct from the factory, or upon application at any of our nation-wide sales and service offices. (1042)

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Elevator Entrances by

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STUDIES IN TECHNICAL CO-OPERATION

Good general illumination and ample show case illumination prove excellent aids to merchandising.

STYLE TRENDS IN STORE LIGHTING

demand adaptability in wiring

By H. A. LORENTZ
of Lorentz and Lorentz, Architects
Canton, Ohio

Early studies for the Lefkovits store in Canton, Ohio, indicated the need for an electrical layout capable of taking care of changing requirements for light. For the modern store, responsive as it must be to style developments, watches for improvements in lighting and in the use of electricity as closely as it watches markets and style trends in merchandise.

It was natural to turn to the wiring and lighting bureau of the electric service company serving the territory for information that would help provide continuing adequacy and protect the building against early electrical obsolescence. Here was found a broad background of experience and a valuable store of information that made it possible to project the course of future electrical requirements.

Floodlighting and intensive display window lighting provide an attractive exterior.

The lighting installation decided upon with the help of this lighting bureau provides seventy-five window reflectors with 200-watt lamps on one-foot centers and floodlighting from five 1000-watt projectors. In the interior of the store general lighting of 18 foot-candles is provided and in addition there is ample show case lighting.

Provision is made in the wiring for the installation of extra circuits whenever the style trend in lighting makes them desirable.

In this day of rapid electrical developments provision for meeting future electrical requirements is an important consideration in the design of any building.

For information about trends in lighting standards, and about adequate wiring standards, call on the lighting bureau of your local electric service company, or write direct.

NATIONAL ELECTRIC LIGHT ASSOCIATION, 420 LEXINGTON AVENUE, NEW YORK, N. Y.

HOLD YOUR HAND ON THE SMOKE STACK

......*High stack temperature means wasted heat....*

If a smoke stack is running a temperature, the boiler is not efficient. Heat is being lost up the chimney. In coal-fired boilers... or with oil burners installed in ordinary boilers built for coal firing... stack temperatures are often high. That means wasted heat and high heating costs.

The ordinary boiler... with its short wide flues... is not built to absorb the intense heat of burning oil. It has remained for Gar Wood and his engineers to stop this waste.

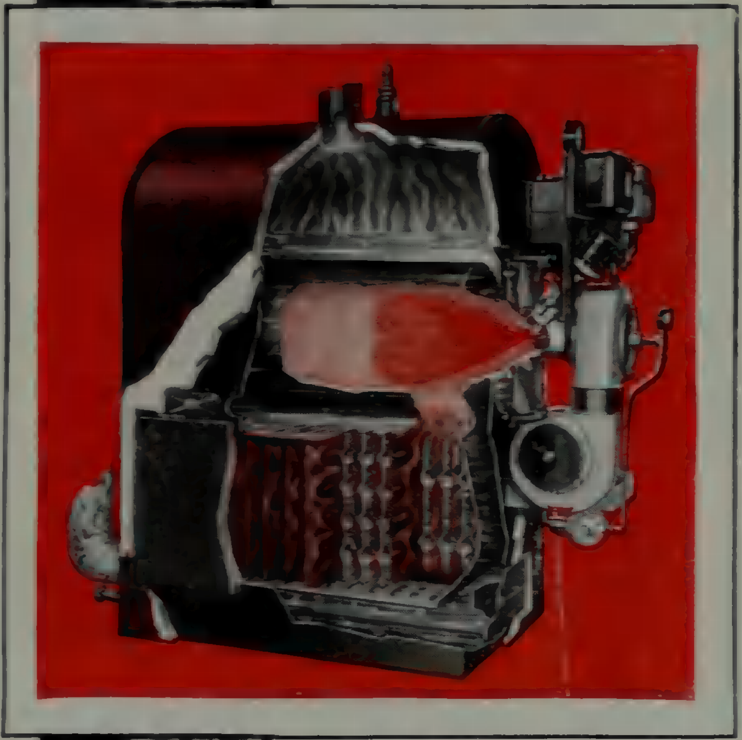
They did it... successfully... by building a boiler like an automobile radiator. Long narrow flue passages *vastly increased the heating surfaces*. Water tubes were baffled to cause a *scrubbing action* of the gases against their walls. The result is an almost complete transfer of heat to the boiler water. Stack temperatures are just high enough to prevent condensation.

The Gar-Wood burner is engineered to fit the boiler's combustion chamber. Almost perfect combustion is effected. From the moment the Gar-Wood burner starts, its flame burns in suspension, without the use of refractory linings.

In the ordinary oil burner, the fire pot of the boiler must have a refractory lining. This is a clay tile which will heat quickly and vaporize the oil particles not atomized at the burner nozzle, and thus prepare them for combustion. Until this refractory lining is hot... which takes from three to ten minutes... the burner cannot operate at maximum efficiency.

The Gar-Wood... with boiler and burner engineered into one complete balanced heating unit provides automatic heat from either oil or gas at a cost that is less than coal. Get the facts and figures. *Mail the coupon now.*

Responsible organizations now distributing through the heating trade should investigate the Gar-Wood franchise. Write the factory for details.



The Gar-Wood boiler is actuated by the "counter flow" principle. Fuel burns in the cylindrical combustion chamber (upper section). Gases travel downward between water tubes (middle section), then to the collecting flue (lowest section). Water and steam travel upward.

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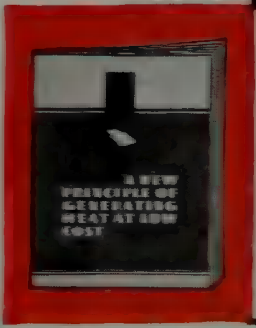
Gar-Wood



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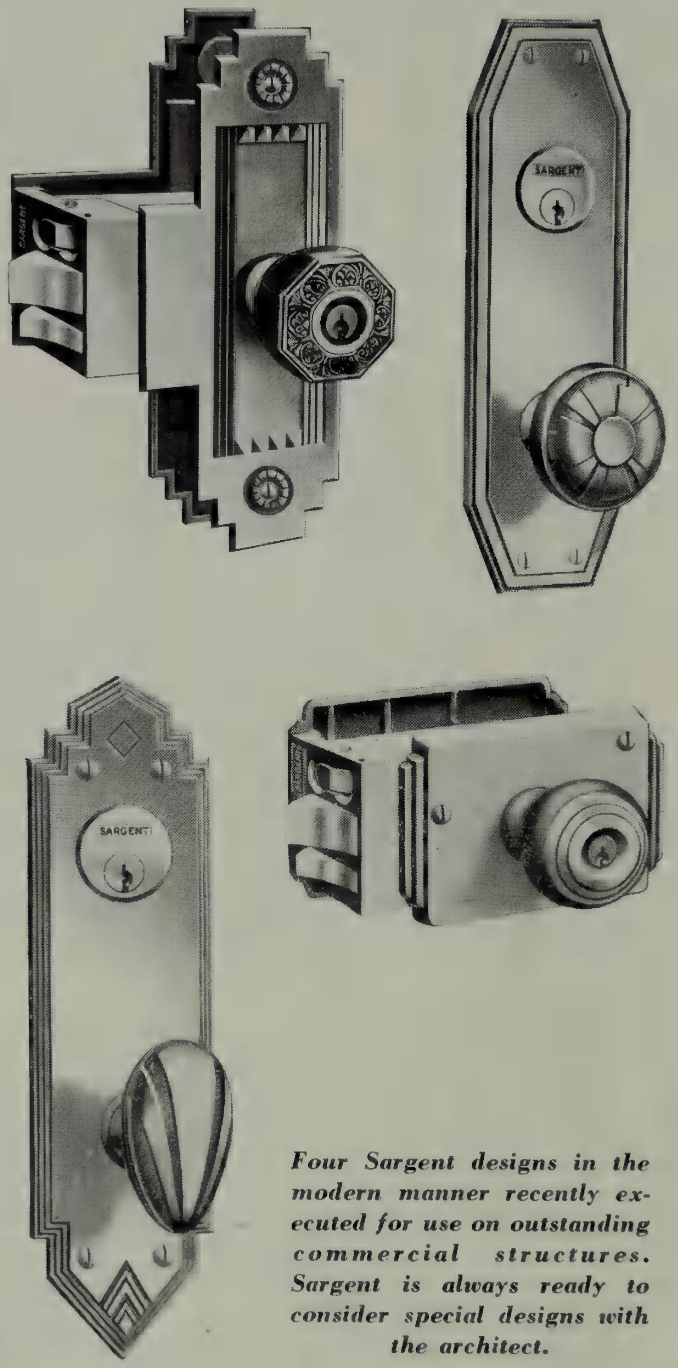

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A NEW idea of proportions, planes in symmetry, balanced angles, lines that extend unbroken—such qualities have come to characterize most of the commercial architecture of today. In step with every trend, Sargent has taken each new design element as it appears, adapted it to the strictest mechanical requirements, and produced builders' hardware equipment entirely modern—modern in beauty and modern in the perfection of its metal craftsmanship.

Sargent will execute designs specially made by the architect for an individual building, or Sargent artists and modelers will suggest special pieces designed from the architect's plans and drawings or direct from a building's decorative motif. Sargent's modern hardware is made in virtually every metal and in every kind of finish. We shall be pleased to consult with you regarding hardware for any type of building or any style of architecture. Send for our new booklet, "Modern American Designs in Sargent Hardware." Sargent & Company, New Haven, Connecticut.

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Such a glass is Adamston Vertically Drawn Flat Glass—as perfect as Men, Money and Machinery can make it.

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AS THROUGH THE
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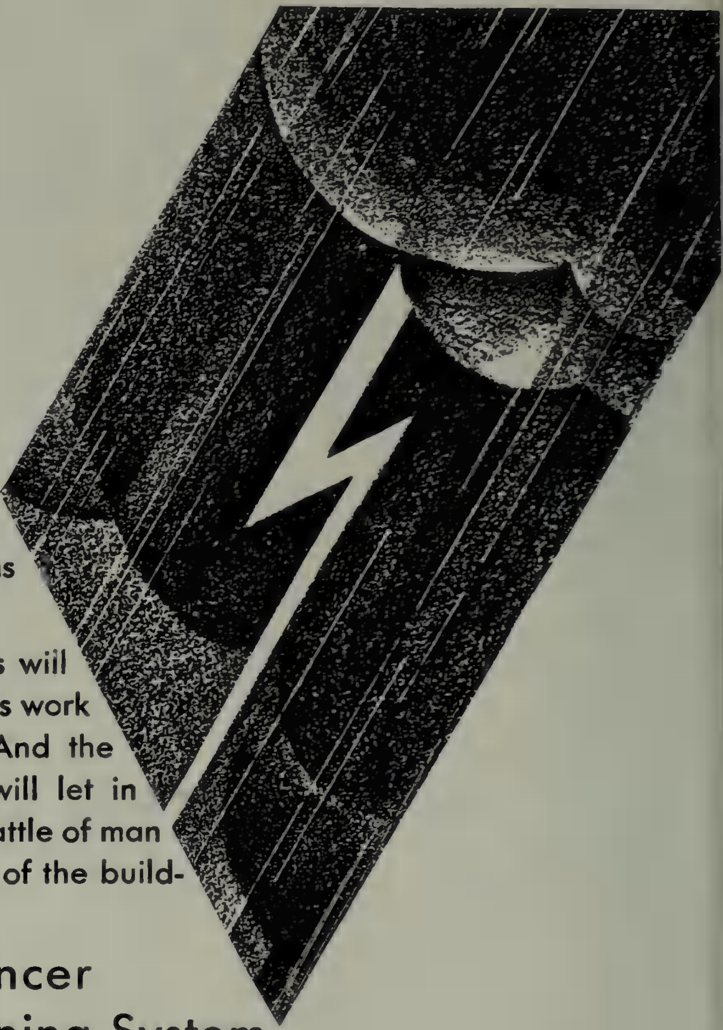

A new structure rises — is completed —and occupied. You have protected it against all the elements of the heavens —but how about man?

The very first army of workers will track in *dirt*. The very first day's work will leave a trail of debris. And the first window that is opened will let in destructive dust. And the battle of man against the very efficiency of the building has just begun.

The Spencer Central Cleaning System

is used mostly because it reduces the time and cost of cleaning a building. It pays for itself in a very few years.

But the really important point is that this method removes dirt and even the finest dust before it can accumulate.

It reduces both the cleaning and redecorating costs.

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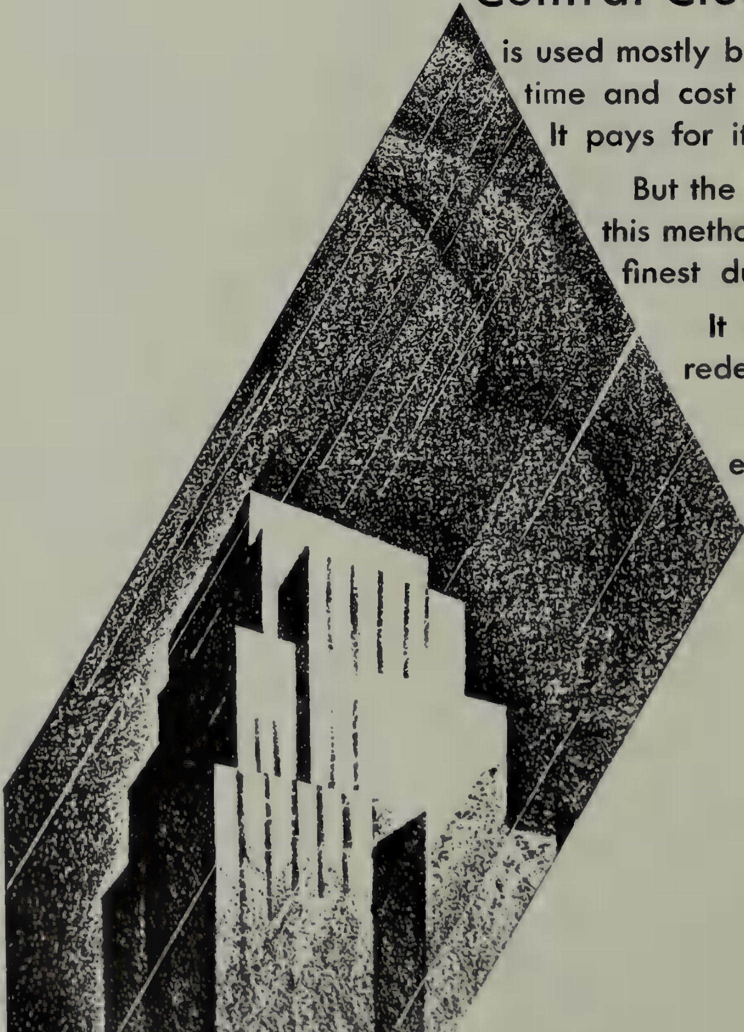

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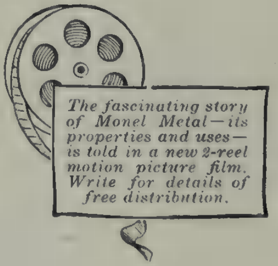
Monel Metal keeps Cabinets looking NEW!



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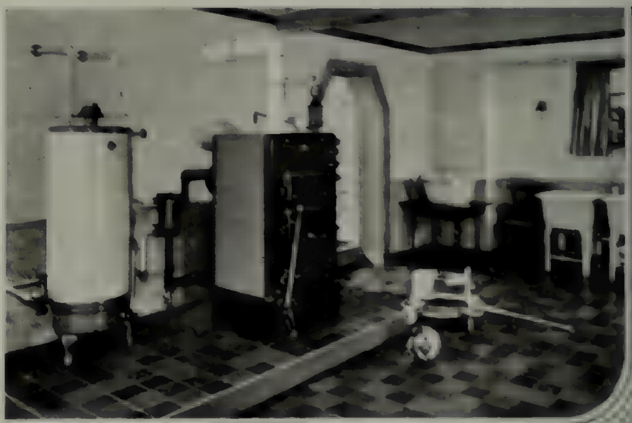
4 UNUSUAL HOMES THAT ARE AS COMFORTABLE AS THEY ARE ATTRACTIVE

● *Four unusual homes by Duncanhunter, New York, Architect*

▼ Here are four homes that are unusual in design, unusual in construction, both outside and inside. But without comfortable, even warmth, they would be *dreary.*

▼ The architect who designed these beautiful homes describes them as "four All American jobs of all satisfaction."

▼ And the owners, who occupy them, all feel that the architect deserves their enthusiastic praise for giving them 100% American Radiator warmth. This is the same experience that architects all over the country are having—evidence that efficient heating has much to do with the final satisfaction of every owner.



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In color, chosen for Central Illinois Public Service Co. building, Springfield, Ill.

Architects . . . Law, Law & Potter, Madison, Wisconsin.

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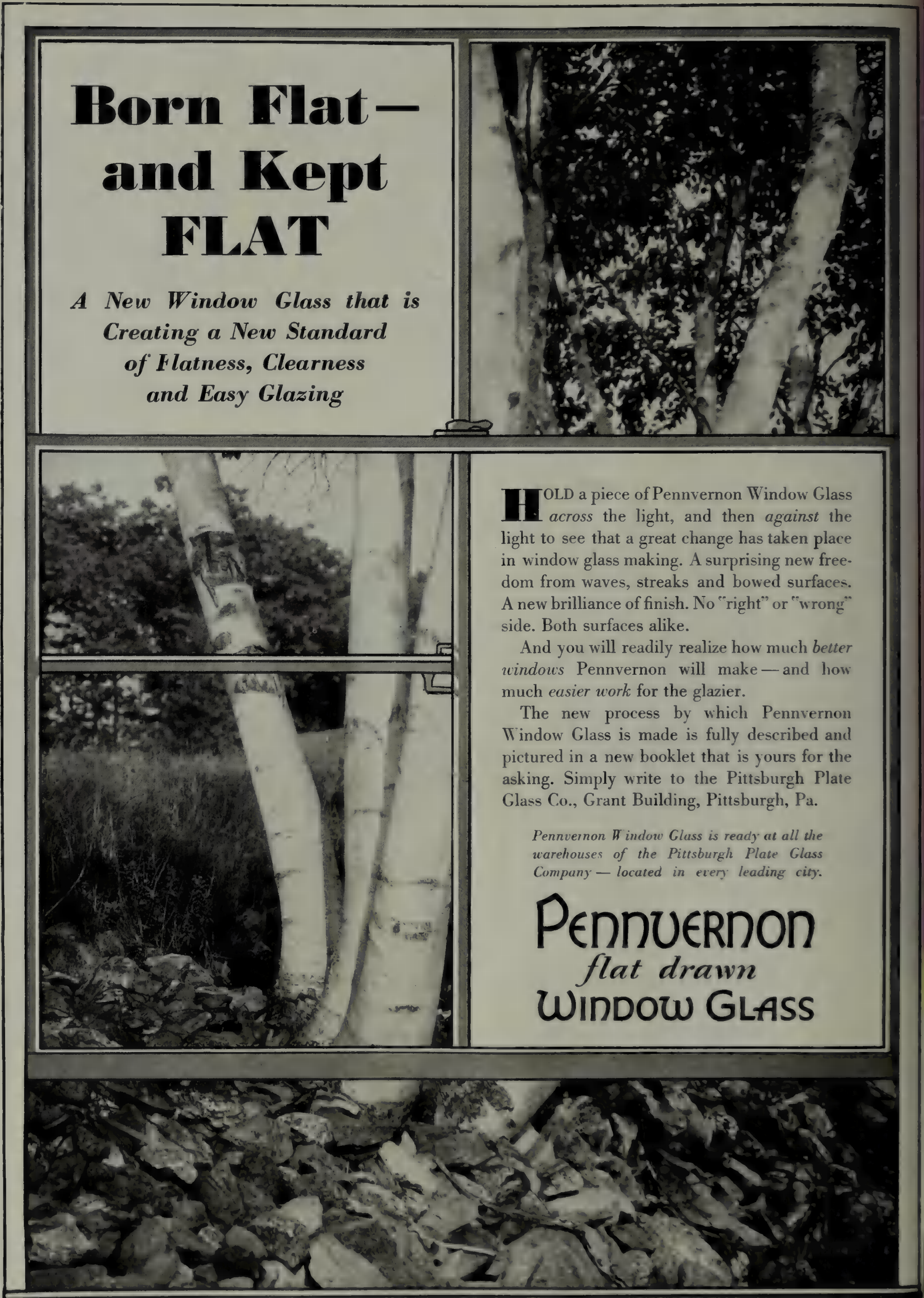
Healthy, safe, practical drinking mound formed by distinctive two-stream projector with automatic stream control. Positive sanitation always.

For·THIS NEW STRUCTURE

The architects selected Halsey Taylor Drinking Fountains for this Springfield (Illinois) building. The factors that govern their choice . . . beauty of design, assurance of sanitation, freedom from servicing . . . are bound to appeal to the most discriminating architect, builder or owner! Play safe with "the specification for sanitation". . . . The Halsey W. Taylor Company, Warren, Ohio.

HALSEY TAYLOR *Drinking Fountains*



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HOLD a piece of Pennvernon Window Glass *across* the light, and then *against* the light to see that a great change has taken place in window glass making. A surprising new freedom from waves, streaks and bowed surfaces. A new brilliance of finish. No "right" or "wrong" side. Both surfaces alike.

And you will readily realize how much *better windows* Pennvernon will make—and how much *easier work* for the glazier.

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EVERY working part of a Jennings Suction Sewage Pump is within easy reach. The entire assembly... pump, motor and controls... is installed out on the floor away from the pit. Only the suction pipe is submerged.

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SUCTION
SEWAGE
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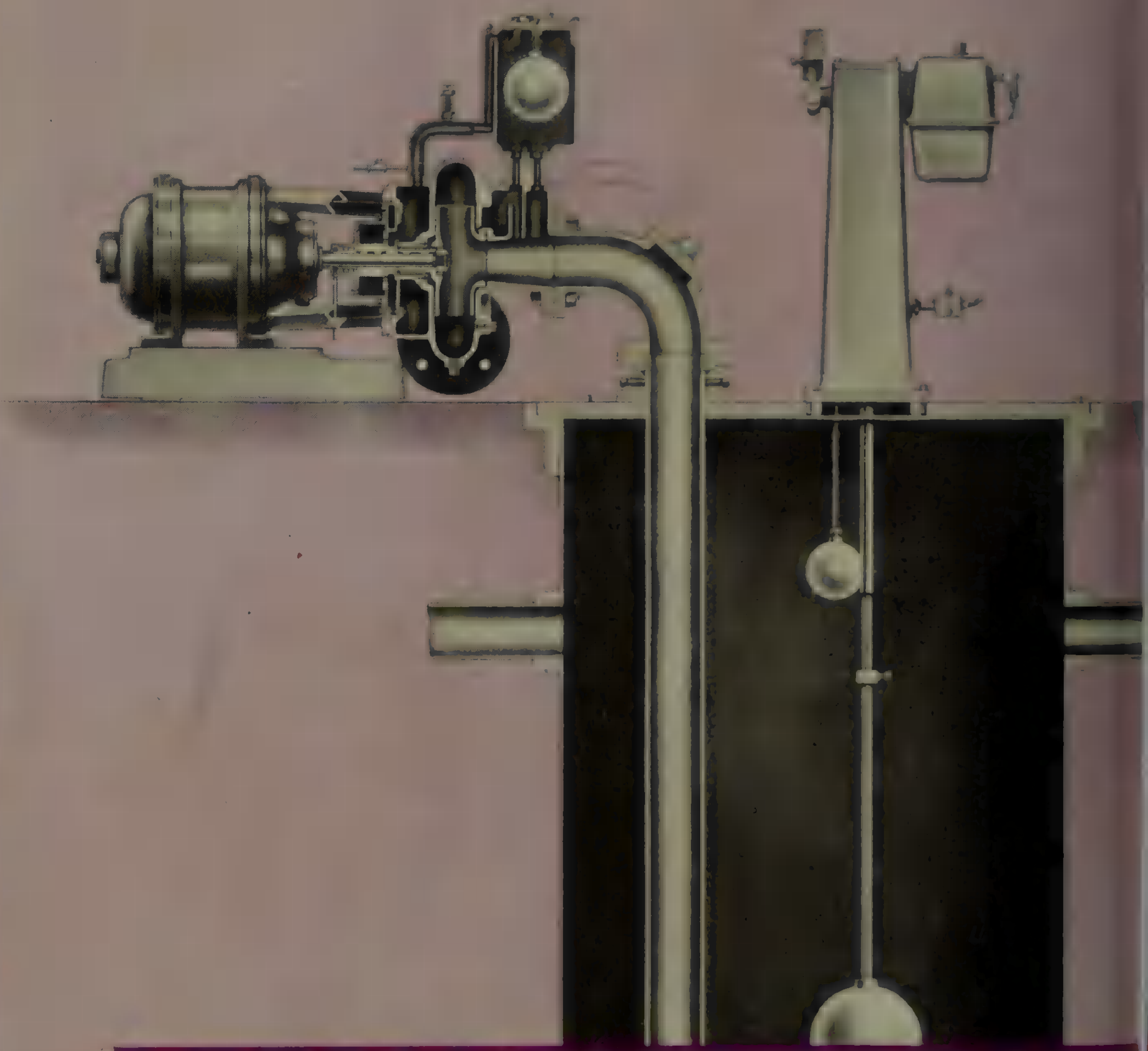

Note these 10 *features of Jennings Design*

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2 The only two moving parts are mounted on a single heavy shaft requiring but one stuffing box, eliminating flexible coupling.

3 A rugged supporting bracket, integral with motor end shield, makes pump and driving motor a single compact assembly in perfect alignment.

4 The non-clog impeller is accurately balanced, liberally proportioned, readily reached.

5 There are only two bearings to lubricate.

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7 Priming unit is a simple, sturdy Nash Hytor.

8 Iron catch basin has gas tight cover.

9 Controlling float switch is totally enclosed and oil immersed.

10 Ball float has adjustable stop.

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"Use this cream white cedar for cabinet work"

"PORT ORFORD CEDAR *should be more largely used for cabinet work*" declare Berner & Wilson, of London. Smeaton & Hanscomb, also of London, highly recommend this wood.

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Spacious Port Orford Cedar linen closets of the M. A. Harris home, Atherton, Calif. Ward & Blohme, San Francisco, architects.

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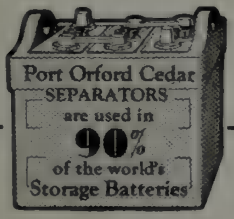

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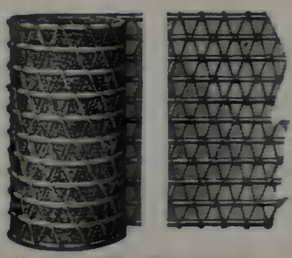
Wire Fabric being laid on floors of Carew Tower



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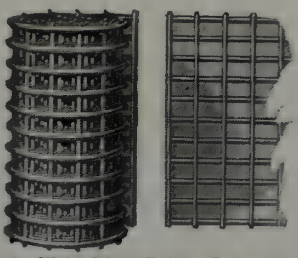

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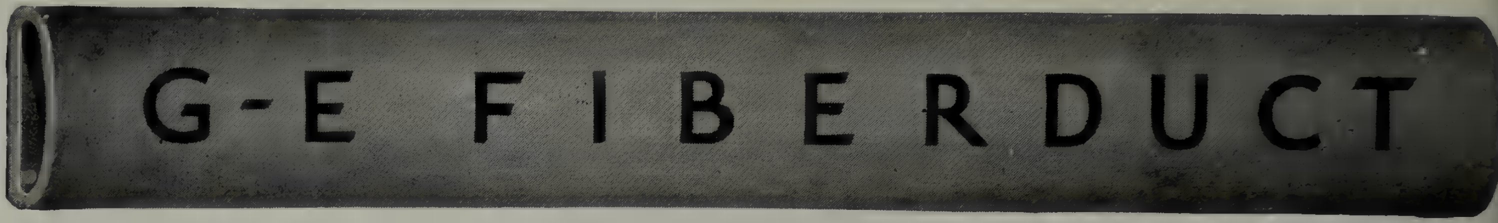

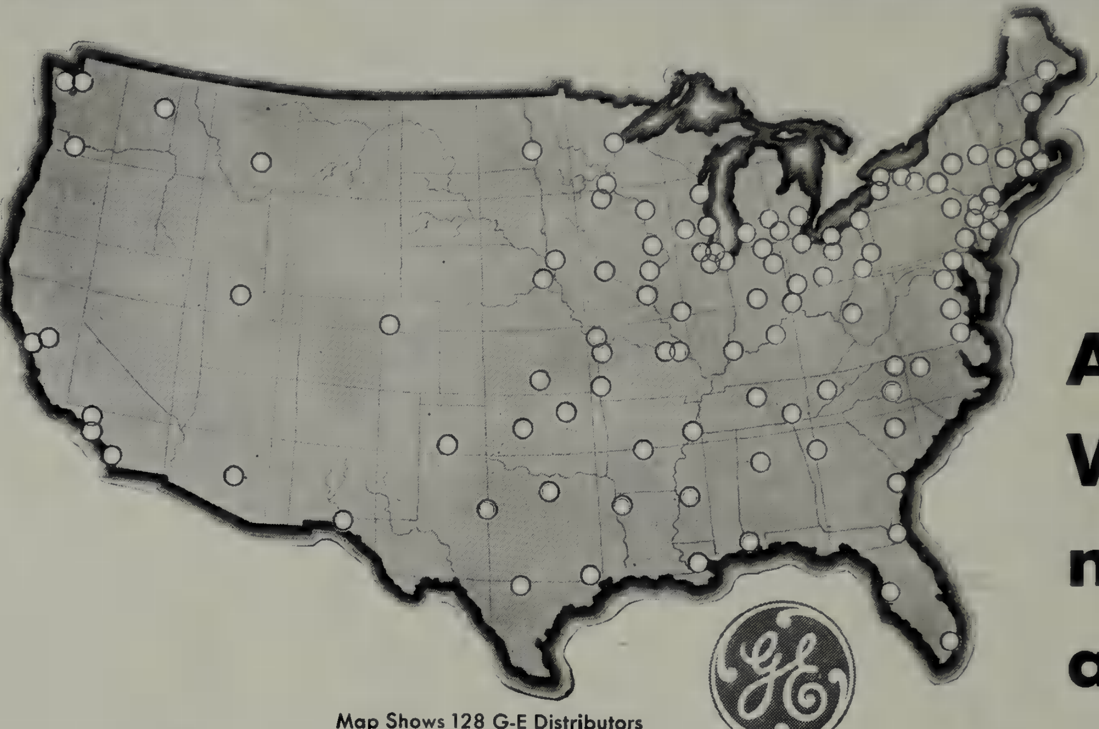

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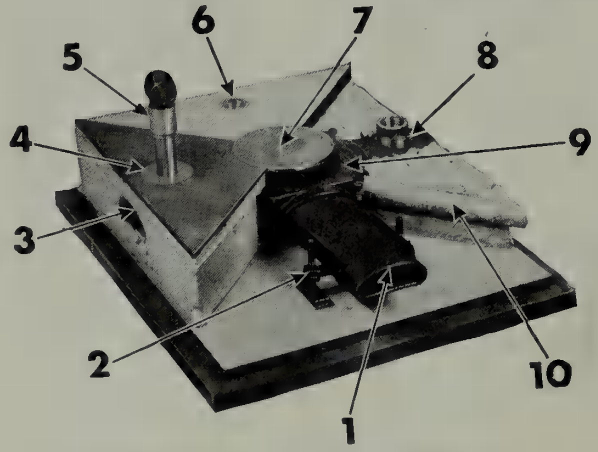

CUTAWAY MODEL—G-E FIBERDUCT
AND FITTINGS

1. G-E Fiberduct.
2. Coupling-support with leveling screws.
3. Oval crown 1 in. below surface molds strong concrete arch.
4. Brass floor flange flush with linoleum.
5. Lighting outlet, brass standpipe, bakelite head.
6. Brass insert; grouted—can't pull out.
7. Adjustable-height cover recessed for linoleum.
8. Brass insert threads into duct.
9. Heavy, one-piece iron junction box with leveling screws.
10. Conduit for feeder lines.

YOU can count on quick delivery of G-E Fiberduct—the *modern* raceway for underfloor wiring—*everywhere.* No matter where you are building, a G-E Distributor is nearby with G-E Fiberduct in stock.

And it presents no construction problems to delay a job. It cuts with a wood saw . . . joins easily with clamps . . . adjusts for height readily with leveling screws. Wire pulls in with ease.

It puts unequalled *flexibility* into wiring. Locate outlets exactly where you want them. More can be added *any time* . . . quickly, economically.

G-E Fiberduct is absolutely non-corrodible . . . lasts the life of the building. Its fittings provide surface neatness at any level, with any floor covering.

For further information write Section C-1510, Merchandise Department, General Electric Co., Bridgeport, Conn.

GENERAL ELECTRIC

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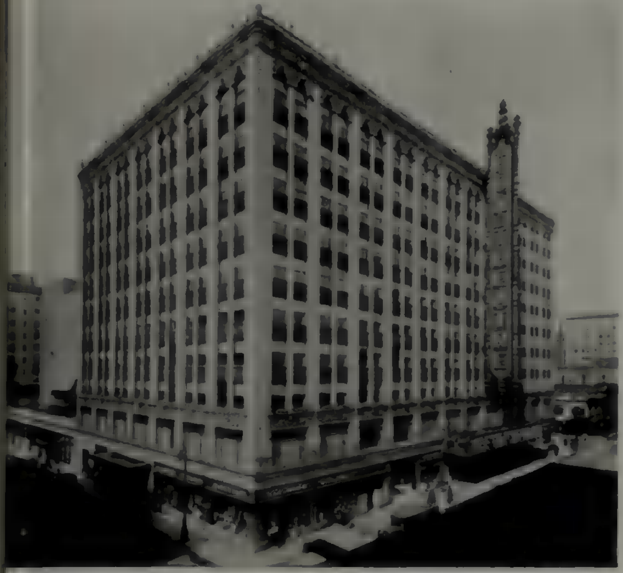
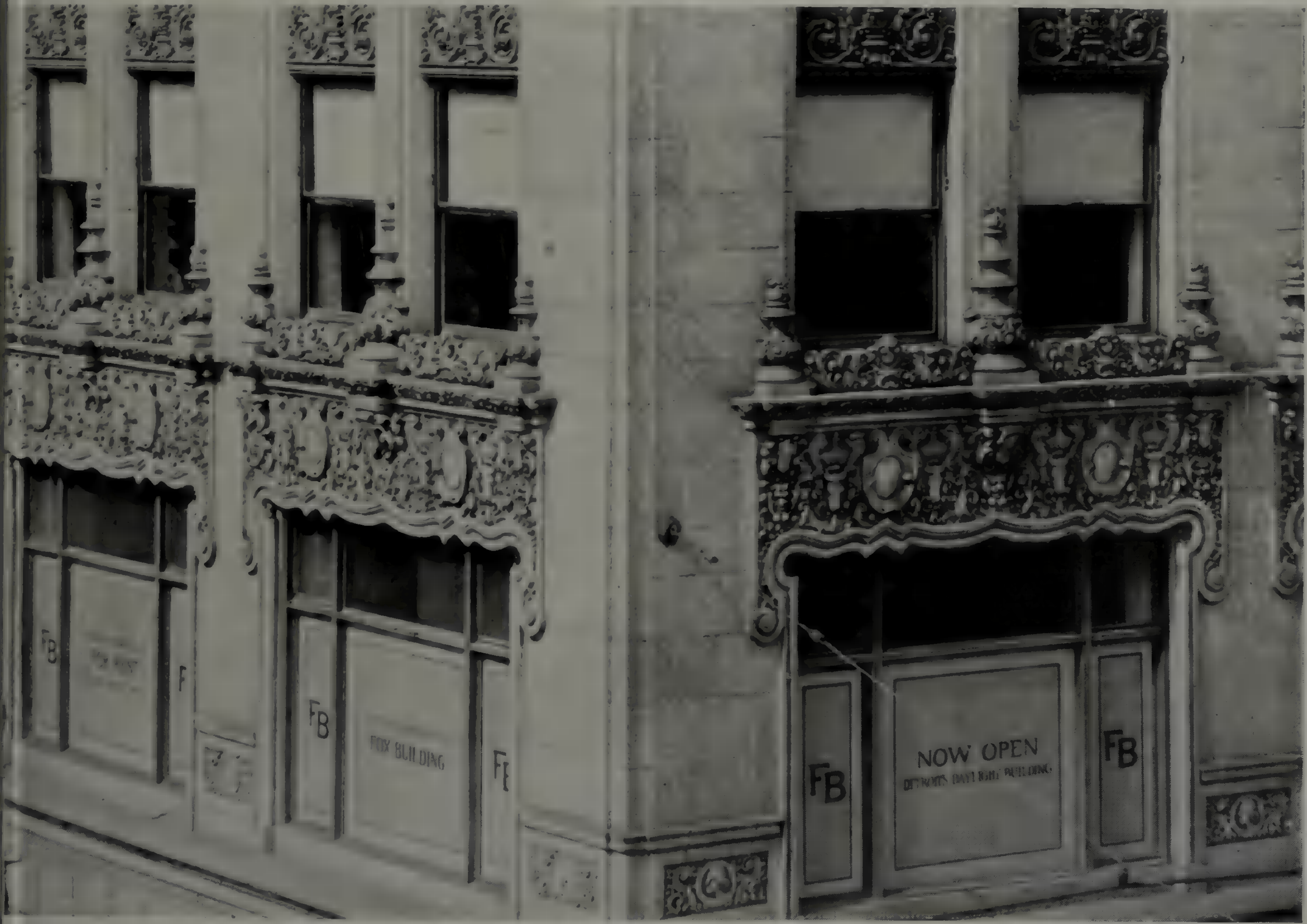
MERCHANDISE DEPARTMENT, GENERAL ELECTRIC COMPANY, BRIDGEPORT, CONNECTICUT

FEDERAL SEABOARD TERRA COTTA



FOX THEATRE BUILDING; DETROIT, MICH.
C. Howard Crane . . . . *Architect*
Aronberg-Fried Co. . *General Contractors*

THIS building is completely faced with Federal Seaboard terra cotta. Of unusual interest is the oak bark surface of the terra cotta ashlar. This is also a good example of the high quality of decorative modeling done by our staff.



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FACTORIES: PERTH AMBOY, N. J. • WOODBRIDGE, N. J. • SOUTH AMBOY, N. J.

Passionist Fathers Monastery, Detroit—Rev. Edmund Walsh, C. P. Architect and Engineer—Arthur Des Rosiers. General Contractors—Talbot & Meier. Plastering Contractor—De Cample Plastering Co. Ohio White Finish used for all interior plaster work. Private choir illustrated above.

The Tranquil Dignity of Cloistered Walls

Achievement of the spirit of peace, quiet, calm, in a religious edifice is, of course, principally a matter of design. Making that spirit a permanent, lasting thing is made possible by the use of worthy materials of construction. Ohio White Finish, for instance, has a permanent whiteness—takes decoration easily—is free from pits and pops—has definite sound deadening qualities. It is selected by many careful architects for their best work.

OHIO HYDRATE & SUPPLY CO.
WOODVILLE · OHIO
Charter Member of the Finishing Lime Association of Ohio

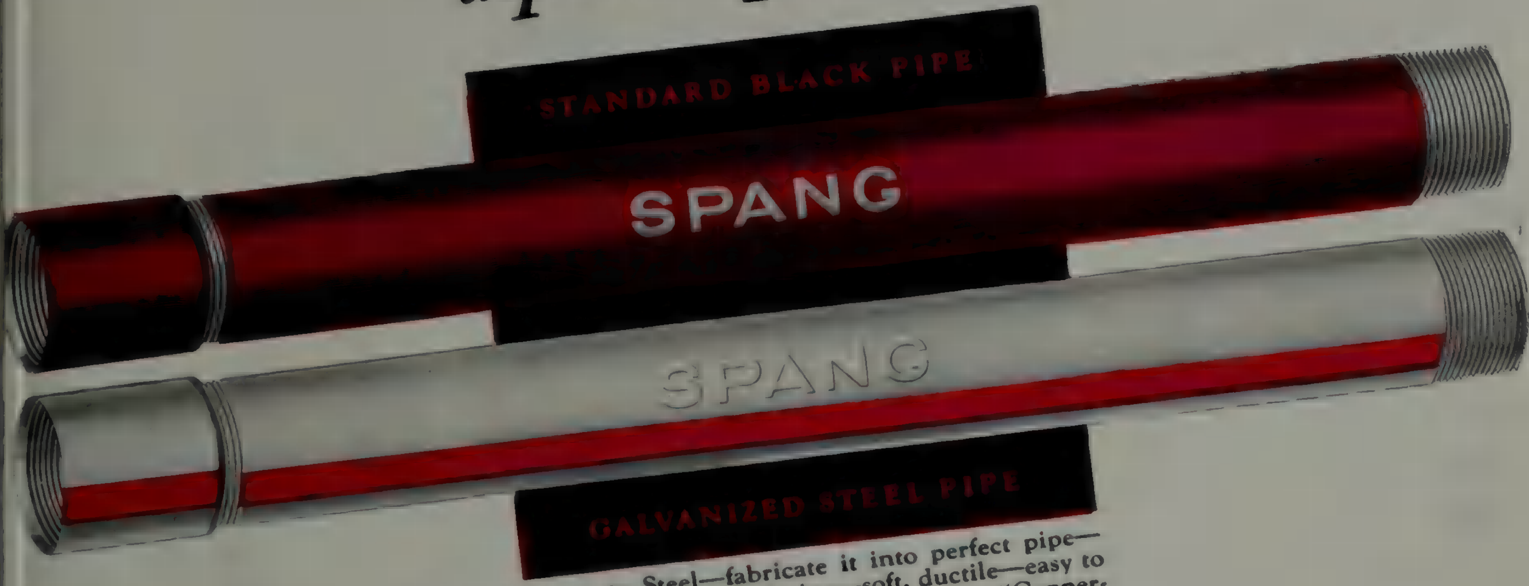
for BETTER PLASTER specify

OHIO WHITE FINISH

See page B-1981
SWEETS

Our lime is marketed under four brand names—Ohio, Hawk Spread, Woodville, Buckeye. All are of equal quality—all are packed in Red Zig-Zag Bags

for all *exposed* piping



Add Pure Copper to Steel—fabricate it into perfect pipe—retain all the virtues of good steel pipe—soft, ductile—easy to bend, to thread—to flange,—and you have Spang "Copper-Clude"—the *genuine* Copper-Steel Pipe.

For soil, vent or drain pipes—for every use where pipe is exposed to atmospheric corrosion or to alternate wet and dry conditions—use "Copper-Clude" pipe—it will add many years to the life of the installation.

Look for the Maroon color—Solid on Black Pipe—in two wide stripes on Galvanized.

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WESTINGHOUSE ELECTRIC
ELEVATORS

Colonial house at Saddle River, New Jersey, equipped with Fenestra "Fencraft" Casements. Aymar Embury II, Architect.

Architect AYMAR EMBURY II

chooses Fenestra "Fencraft" Casements . . . *Opened . . . Closed . . . Locked . . . without touching* Inside Screens

In selecting Fenestra "Fencraft" Casements for this Colonial house, Mr. Embury considered their unique advantages to his client, including: *screen-free* operation; and the fact that fly tightness is permanently insured by the non-warping, metal-to-metal contact of the *flat screen frames* held firmly against the *flat casement frames.*

"Fencraft" Casements are of heavy solid steel sections, with hardware of solid bronze or nickel silver in a variety of distinctive finishes. Craftsmanship of the high type you would expect from America's oldest and largest steel window manufacturer. Ask for "Fencraft" catalog.

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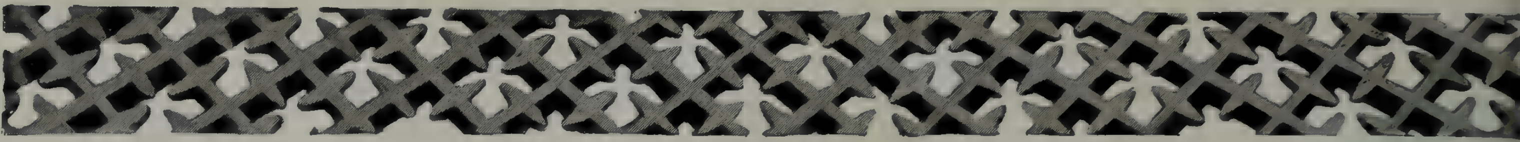
Factories: Detroit, Mich., and Oakland, Calif. Convenient Warehouse Stocks

Fenestra
STEEL CASEMENTS (Screened)



This Snead Armor Grid Gangway

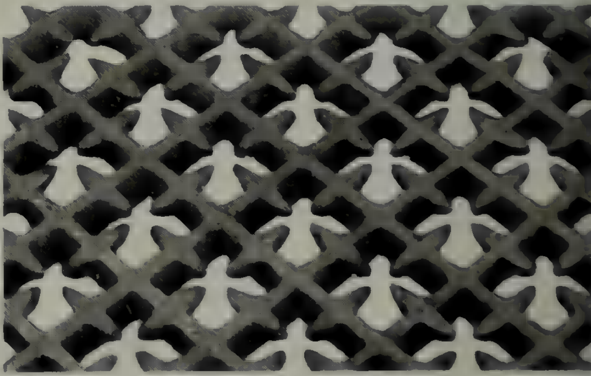
is in excellent condition after two years of extremely severe service » »

BUT that is not at all unusual when you consider that in 18 years of trying usage no Snead Grid installation has ever worn out or required any maintenance work. There's a record of real efficiency as well as just plain bull-dog strength.

Snead Grids are made of an exceptionally fine grade of grey iron and are acid resistant. The pattern is symmetrical and affords perfect protection against crosswise and longitudinal traffic. The effective armor at the surface of each Snead Grid amounts to 41% of its total area. Many sharp edged lugs projecting into the square openings afford good traction and prevent slipping. As the grids are almost totally embedded in the floor concrete, traffic sounds are deadened. The rib sides are rough and bond perfectly with the floor material, eliminating the necessity for expansion bolts or other expensive anchoring devices.

Snead Grids are easy to install. Each grid comes to you complete and there is no expensive assembling operation to perform. Another economy is that Snead Grids displace about 21% of finish floor grout by volume, an important saving when figured over a large area. See Sweet's or write us direct.

Above is pictured a section of the foundry gangway at a prominent Rhode Island plant. The gangway consists of approximately 5,500 sq. ft. of Snead No. 30 Heavy Duty Armor Grids and has been installed for about two years. A careful inspection recently made revealed the surface to be in really excellent condition despite the terribly heavy traffic to which it has been subjected. We make the prediction that this gangway will be as satisfying 20 years after installation as it is right now.



Three sizes of grids are manufactured and answer practically all requirements. These are No. 10 for lighter traffic. No. [redacted] for heavy traffic and No. 30 for extremely heavy loads. No [redacted] is here illustrated.

SNEAD & COMPANY – Founded 1849

SELF-ANCHORING ARMOR GRIDS FOR CONCRETE AND ASPHALT FLOORS

92 Pine St., Jersey City, New Jersey

For larger homes there has really been no problem. H. B. Smith Boilers have proved outstandingly satisfactory under the special and severe conditions set up by the modern Oil Burner.

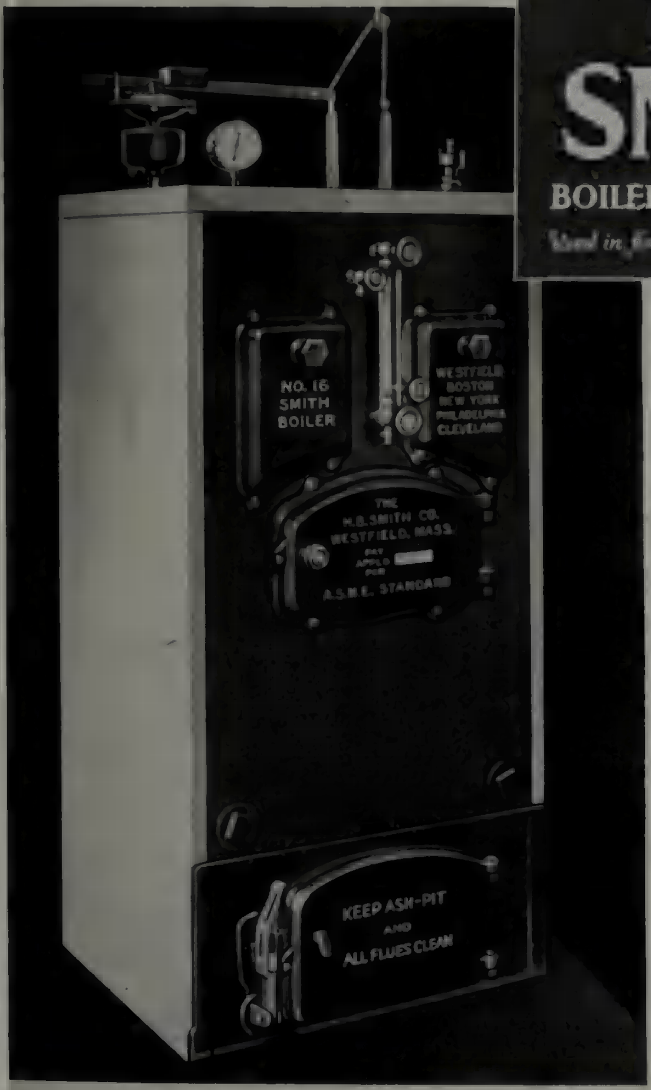
But for "medium-to-small" homes there has been a problem because no Smith sectional boiler of sufficiently small size was in existence.

To correct this situation the New Smith "16" was developed—a small, sectional boiler with all the efficiency features of the larger Smith sectionals.

What Boiler

for a Small Home

Where an Oil Burner Is Used?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GRANITE

CONTRIBUTORS

John Burnet: *English architect and designer of the Royal Institute of Fine Arts, the British Museum extensions.*

Corbett, Harrison and MacMurray: *architects of the Roerich Museum and Master Apartment Building, published in the December 1929 issue.*

Livesay and Wiedemann: *architects and engineers practicing in Beaumont, Texas.*

Cornelius S. Loder: *a hospital consultant with offices in New York.*

William Muschenheim: *educated in Boston and has worked with Korn in Berlin, Peter Behrens in Vienna and Joseph Urban in New York.*

Swasey and Hayne: *Los Angeles architects specializing in banks.*

Walker and Gillette: *New York architects specializing in banks, office buildings and country houses.*

Weary and Alford: *designers of banks and office buildings with offices in Chicago.*

Henry Wright: *city planner and a frequent contributor to* The Architectural Record.

CALENDAR OF EVENTS
GENERAL ANNOUNCEMENTS

October	The Department of Architecture of the University of New York will begin a series of lectures on "Promoting and Financing Building Projects."
October	International Hygienic Exhibition at Dresden, Germany. Buildings include a model hospital and a model housing project.
October-Nov. 15	"Man and Machines," an exhibit representing western industrial civilization, at Museums of the Peaceful Arts, 220 East 42nd Street, New York City.
Oct. 6	Exposition and demonstration of road construction equipment and materials, under auspices of American Road Builders' Association, Washington Auditorium, 19th Street and New York Avenue Northwest and demonstration field, Rock Creek and Potomac Parkway, Washington, D. C.
Oct. 7-10	Annual convention of the Illuminating Engineering Society. Hotel John Marshall, Richmond, Va.
Oct. 8-12	Sixth National Conference of Church Architecture, Cleveland, Ohio.
Oct. 30	Competition for designing bathrooms, sponsored by Standard Sanitary Manufacturing Co. Professional advisor, Howard K. Jones, firm of Alden, Harlow and Jones, 2103 Farmers Bank Bldg., Pittsburg.
Nov. 18-29	Art Exhibition, Royal Institute of British Architects, London (9, Conduit Street).
Dec. 1	Competition for "esthetic improvement" in design of water tanks, sponsored by Chicago Bridge and Iron Works. Albert M. Saxe, 430 N. Michigan Avenue, Chicago, architectural advisor.
Dec. 1-6	Ninth National Exposition of Power and Mechanical Engineering, Grand Central Palace, New York City.
April 18-25	Fourth Biennial Architectural and Allied Arts Exposition, Grand Central Palace, New York.

IN THIS ISSUE

HOW THE ARCHITECT MAY CULTIVATE BUSINESS

Meritorious service is the essential means of increasing practice. Knowledge of community needs and economic requirements and an established reputation based on satisfactory completed buildings bring clients to the architect. At the same time there are methods by which the architect can bring himself to the notice of prospective clients. These are outlined in this issue and illustrated by actual cases.

PORTFOLIO OF BANKS

Banks have been selected for their suitability to the chain bank system. Branch banks illustrated show similarities in exterior treatment but with differences in plan.

TECHNICAL NEWS AND RESEARCH: GLASS

This study illustates the varied characteristics and physical properties of glass in its application to buildings and how glass may be used to best advantage on various types of construction. New glasses on the market, including ultra-violet ray glass, are discussed. Standards for judging relative merits of various glasses are set up.

BUILDING TRENDS AND OUTLOOK—NON-RESIDENTIAL BUILDING

This article by L. Seth Schnitman, statistician, continues the survey of building prospects for residential construction, presented in the September issue. In November Mr. Schnitman will discuss economic conditions within the engineering branch of the construction industry in relation to residential and non-residential building. Charts of material price trends are included.

Palmer Shannon

GREENWICH, CONN. • COGGINS AND HEDLINGER, ARCHITECTS

November issue—

THE COUNTRY HOUSE

New trends in country house work are surveyed in an article by Howard T. Fisher, who has been devoting his time to an investigation of requirements for this type of building. His study takes up such problems as heating and air conditioning, and the advantages and disadvantages of various heating systems and fuels; roof terraces and gardens, and methods of waterproofing, surfacing, and insulation; window sizes, and the proper orientation of rooms for sunlight and summer breezes. A check list of requirements is included.

This issue will consist largely of photographs of country houses together with working drawings, plans and brief descriptions. Selections have been made of houses which illustrate the most recent developments in all styles of domestic architecture as well as in all sections of the country. Many new features in design, planning and construction are shown.

RYE, N. Y.
JULIUS GREGORY, ARCHITECT

Padilla Studios

SANTA PAULA CANYON, CALIF.
WALLACE NEFF, ARCHITECT

Let's UNCOVER the Truth *about* Building Papers!

The Strongest Building Paper Made Splits: Tears and Drags Away From the Nails Under Building Strains—Shrinkage and Settling—unless it is resilient

This between wall destruction of ordinary non-resilient building paper leaves wide holes for the penetration of moisture, dirt, wind and vermin and proves that such papers do not protect regardless of their strength.

Illustrated below is a typical example of what happens between walls to even the strongest non-stretchable building papers when subject to building strains. The Building Paper was a well-known brand—reinforced.

The perfect building paper must be Resilient—Waterproof—Moistureproof and Strong.

Resilient: to stretch and contract under building strains without breaking—Waterproof: to prevent water from passing through—Moistureproof: to prevent moisture from penetrating even its outer surfaces—Strong: to be handled and laid without tearing or scuffing.

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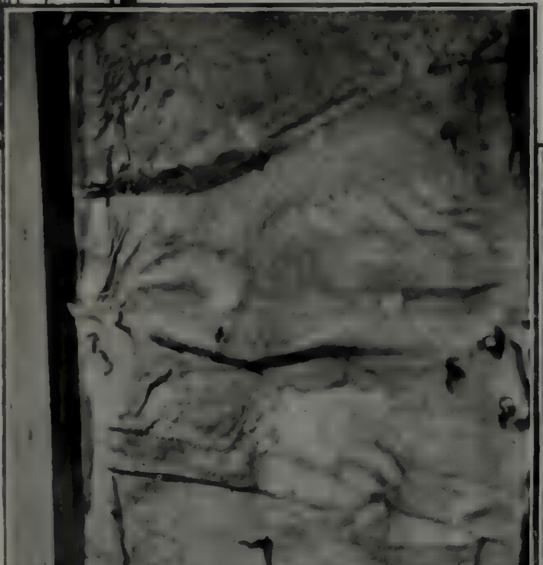

At left: Proving that non-stretchable building paper, scuff, tear, split and break at the nails under building strains and shrinkage. The house being torn down was quite modern. The building paper a well-known brand.

Illustrating Brownskin the Patented Resilient, Stretchable Building Paper that conforms to All building distortions without breaking.

Angier
BROWNSKIN
Resilient
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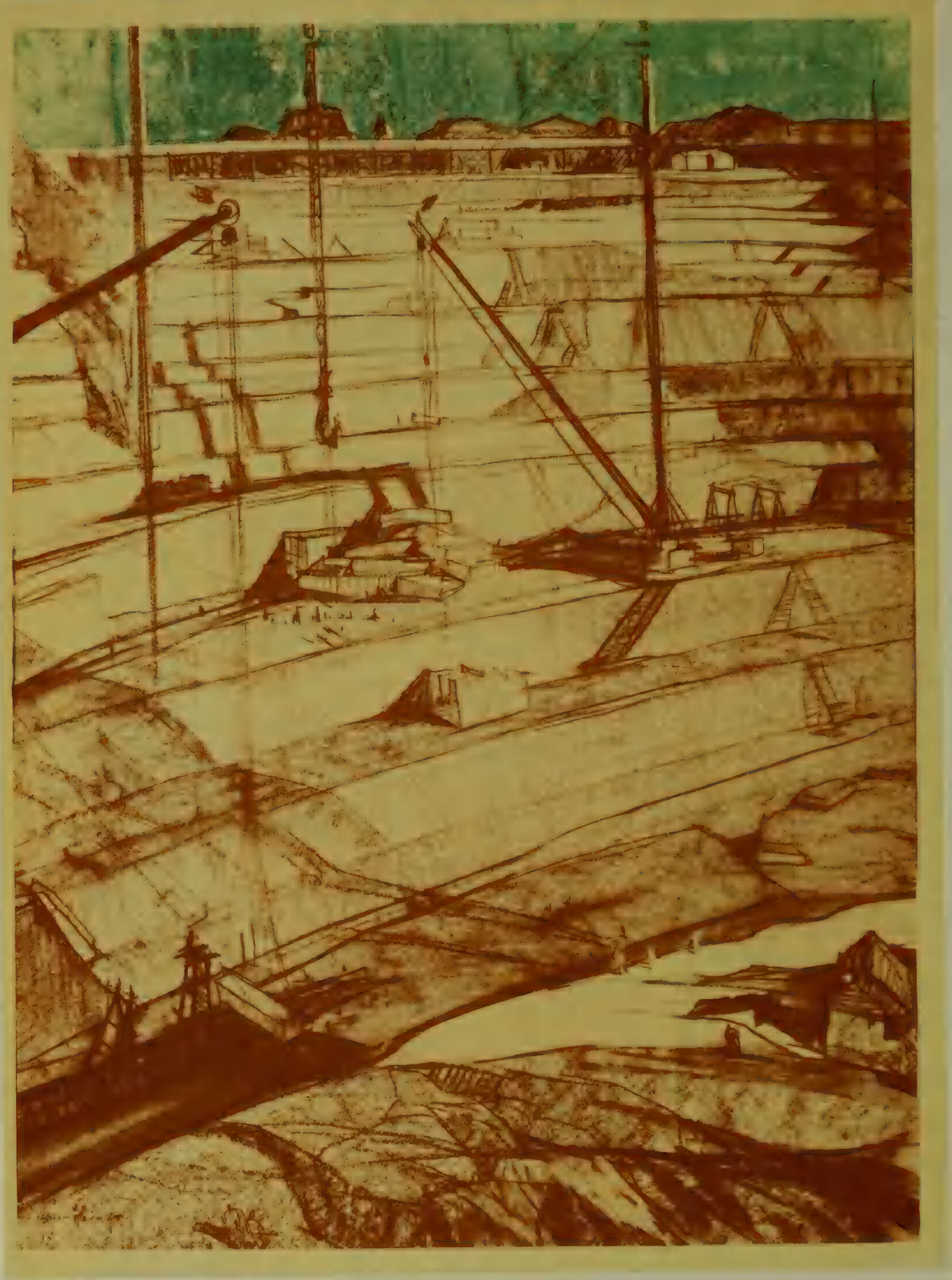

A QUARRY VIEW

This is number one of a series of twelve Drawings made at the Fletcher Quarries by Ernest Born.

GRANITE

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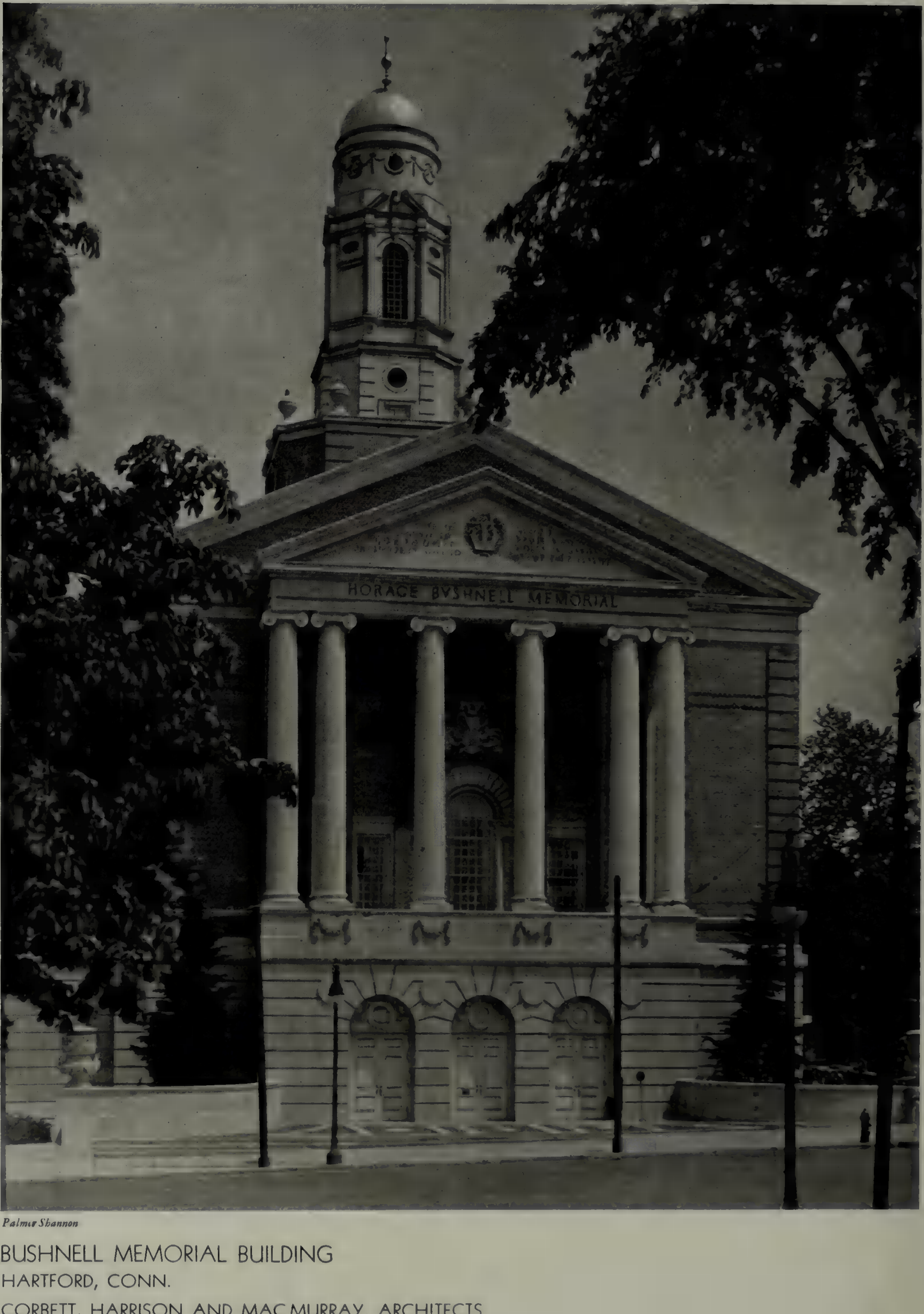


Palmer Shannon

BUSHNELL MEMORIAL BUILDING
HARTFORD, CONN.
CORBETT, HARRISON AND MACMURRAY, ARCHITECTS

THE ARCHITECTURAL RECORD
AN ILLUSTRATED MONTHLY MAGAZINE OF
ARCHITECTURE & THE ALLIED
ARTS & CRAFTS

VOLUME 68 OCTOBER · 1930 NUMBER 4

THE BUSHNELL MEMORIAL BUILDING

HARTFORD, CONN.

CORBETT, HARRISON AND MACMURRAY, ARCHITECTS

The building is a memorial to Horace Bushnell, a leader in civic affairs and one of the main figures in the life of Hartford during the middle of the nineteenth century.

Fronting the building is a large park which Bushnell, by his political and personal efforts, obtained for Hartford, and which has been named for him. In it stands the State Capitol.

•

PURPOSE

The auditorium, with a seating capacity of 3500, was planned to give a place of assemblage large enough to accommodate the occasional visits of the New York Metropolitan Opera Company, the Philharmonic or the Philadelphia Orchestra.

•

COST

The building cost $.65 a cubic foot.

•

EXTERIOR

The local architecture of New England was selected, which it was thought by the architects would conform with other buildings in Hartford and also with the clients' desire to have the style symbolize the life of their father and grandfather.

Brick and buff Indiana limestone are used for the exterior. The roof is copper.

The tower is used for the specific purpose of holding the fire water tank which had to be 20 feet above the highest point of the stage.

•

INTERIOR

The vast size of the auditorium made impossible the same scale and type of architecture as the exterior design. An entirely different style treatment but in keeping with the classical precedents was attempted. The difficulties of the problem can be realized by comparing the space enclosed by the auditorium with the largest room developed by the Colonial builders. Even the memorial room on the second floor of this building, which is comparatively small, is larger than any room built in this country during the Colonial period.

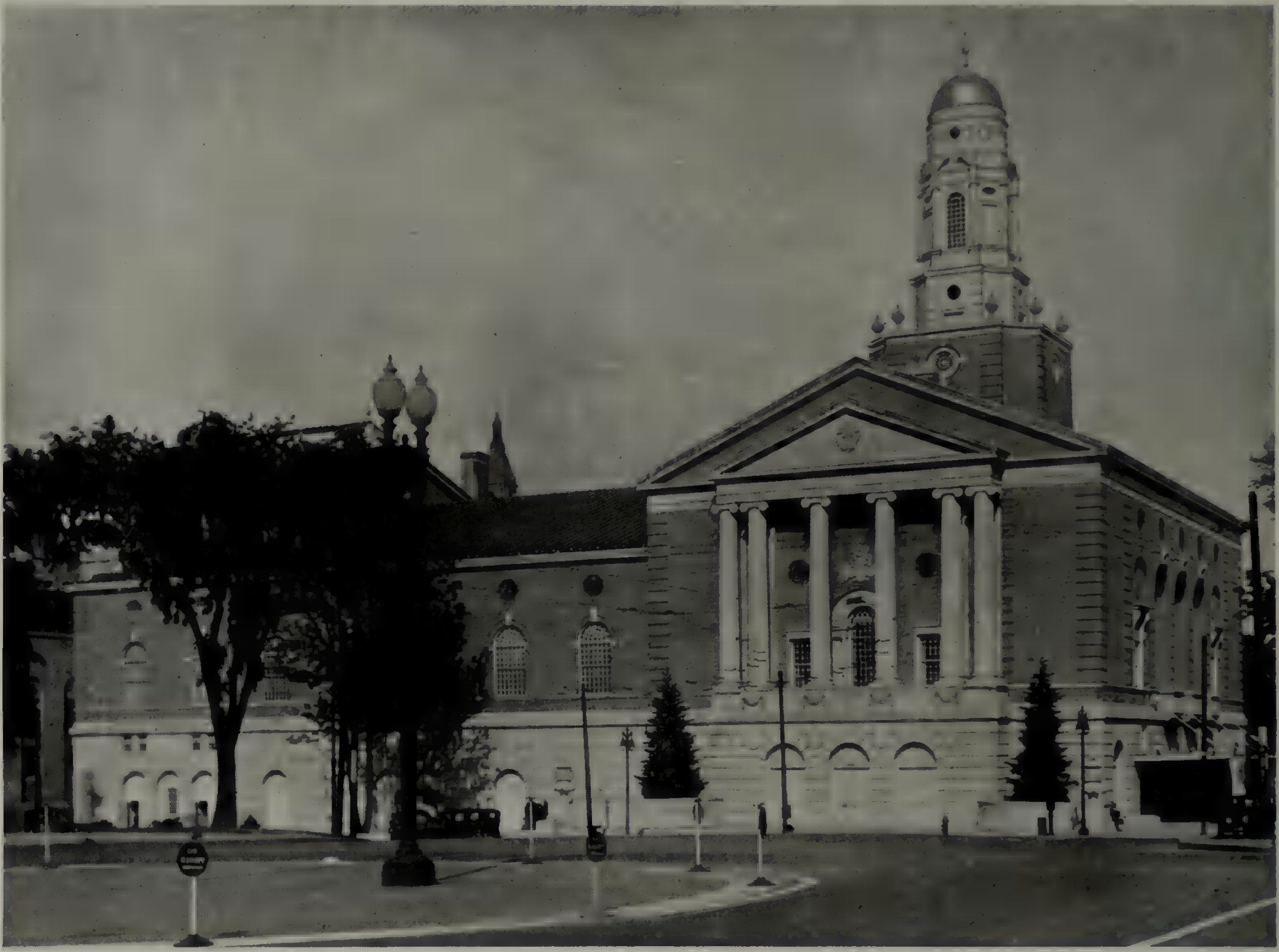
The auditorium provides the necessary mechanical equipment and acoustical effects. Perforated panels give sound absorption.

•

COLOR SCHEME

In the auditorium the lighting is designed so that it can be changed to any color in the spectrum. The walls were therefore kept a neutral French gray and the ceiling painting was done in black, white, gray and gold. The seats and hangings are magenta red, selected by experiments under special lighting conditions.

The memorial room is in natural color with the ceiling slightly tinted.



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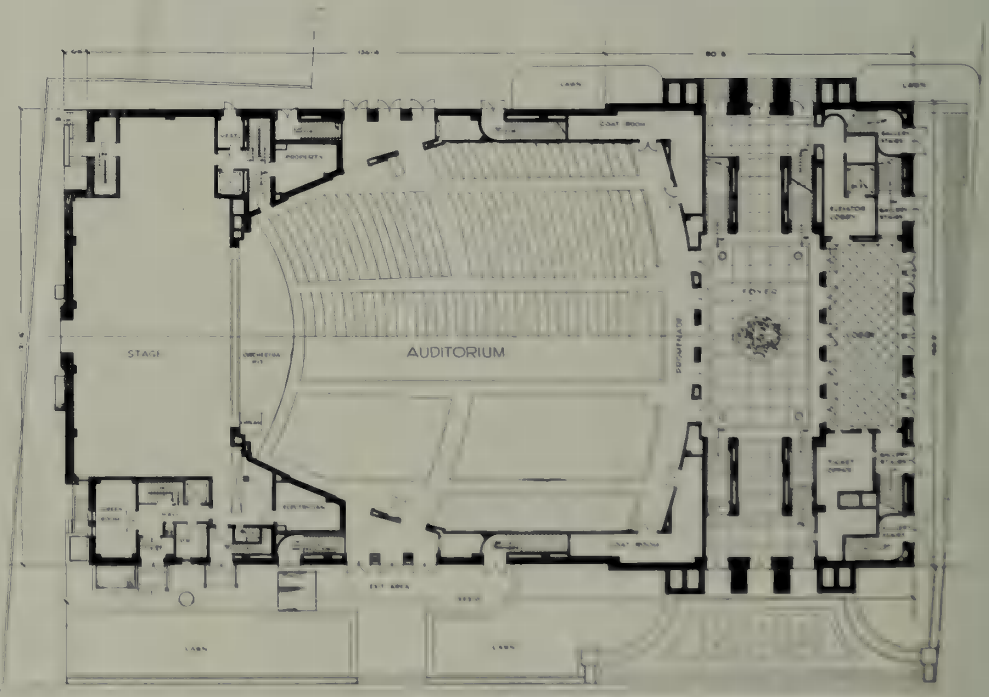
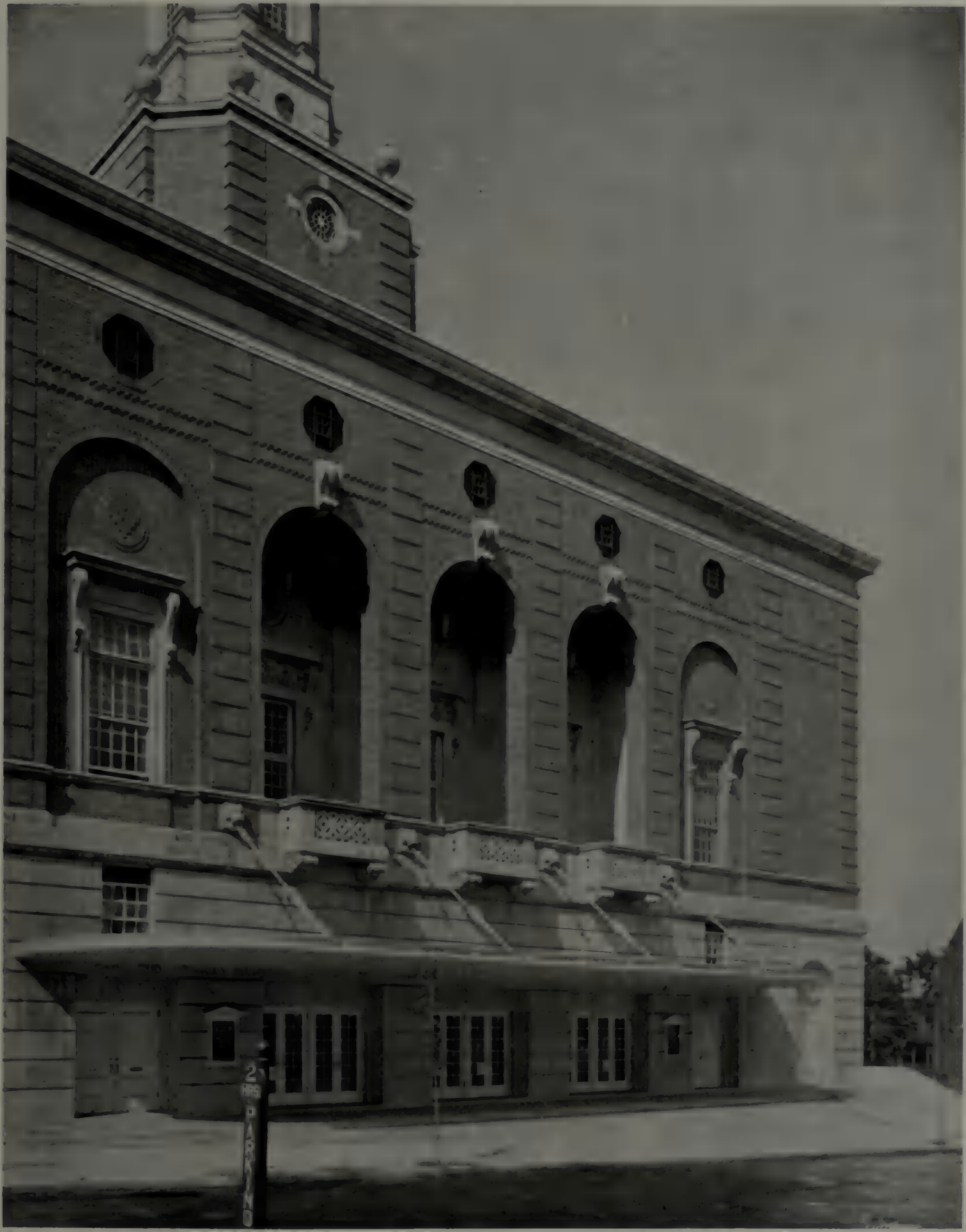
BUSHNELL MEMORIAL BUILDING
HARTFORD, CONN.
CORBETT, HARRISON AND MACMURRAY, ARCHITECTS



GROUND PLAN



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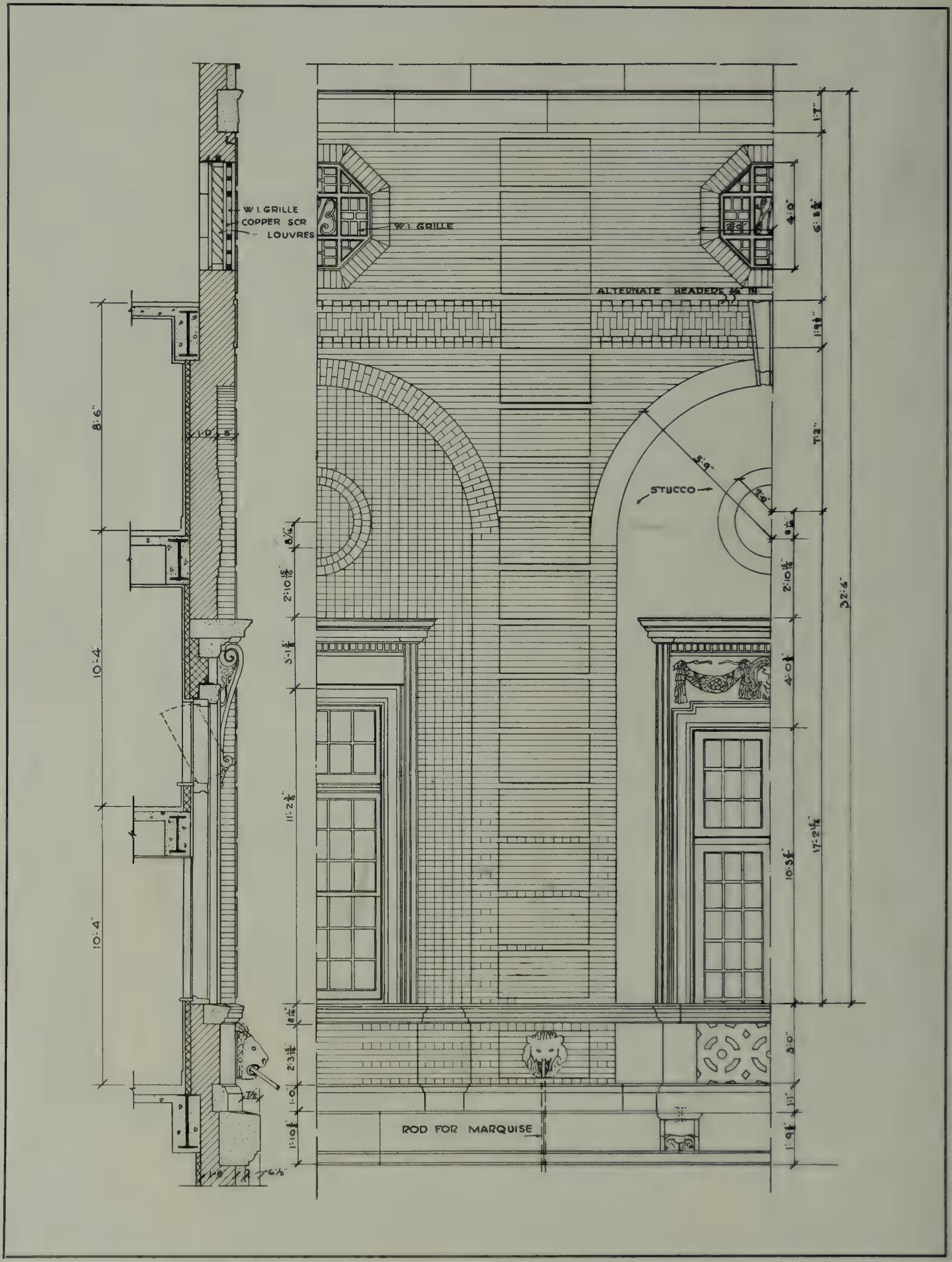

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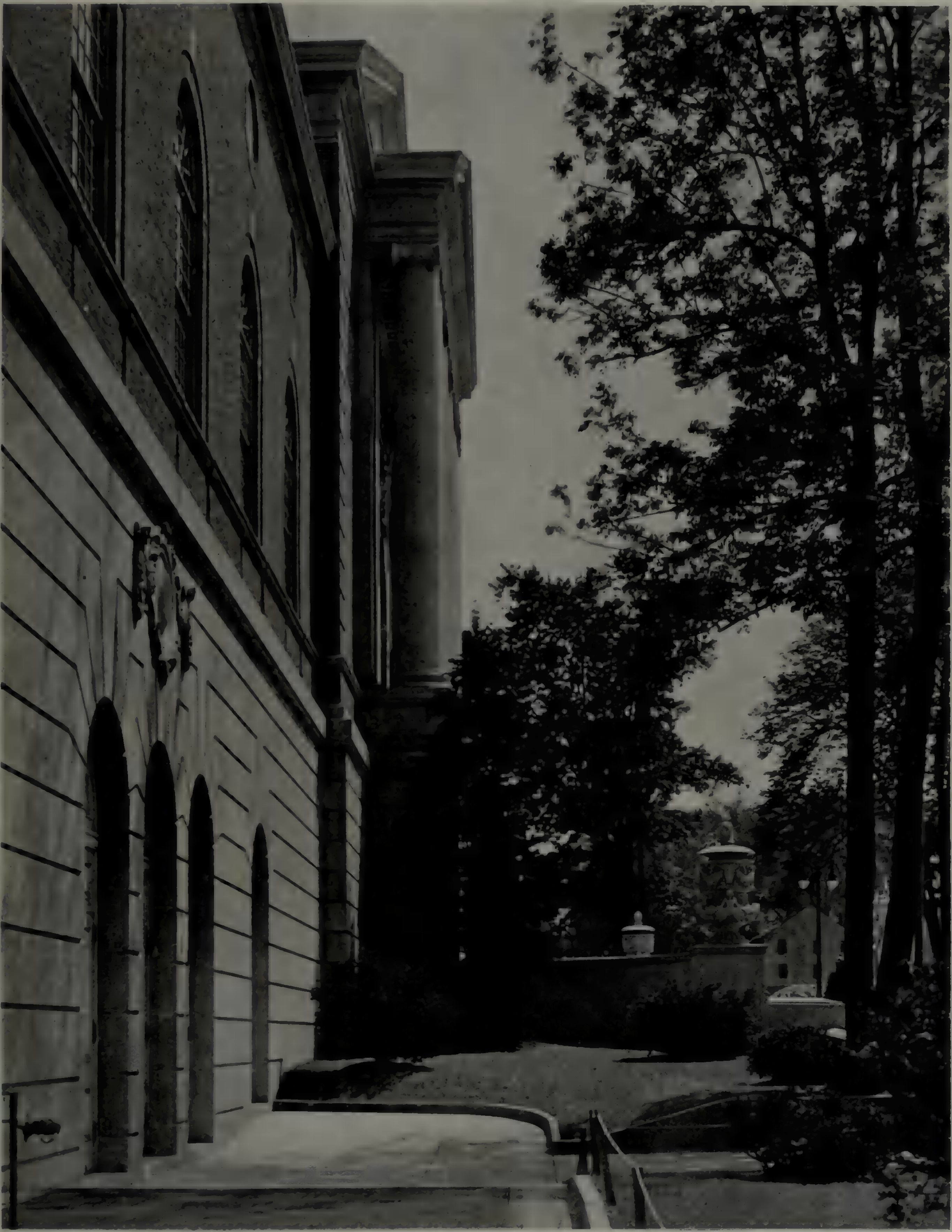

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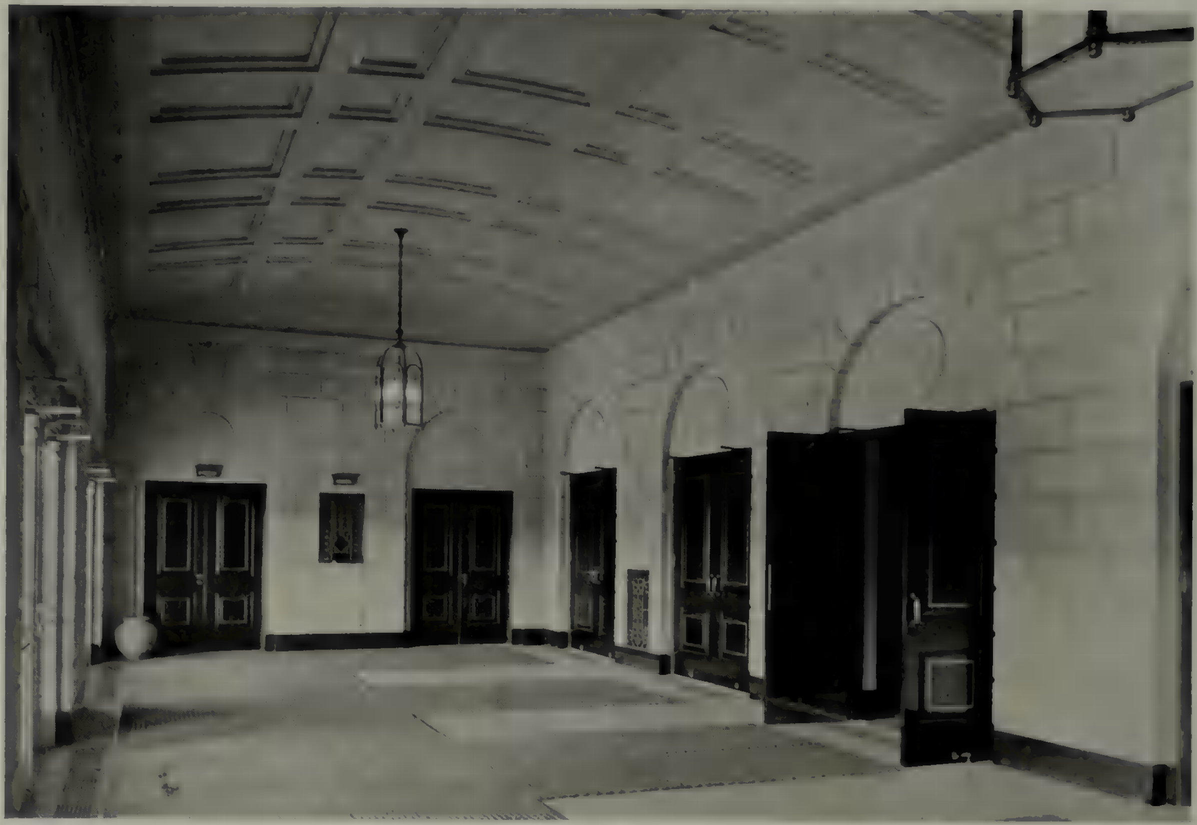

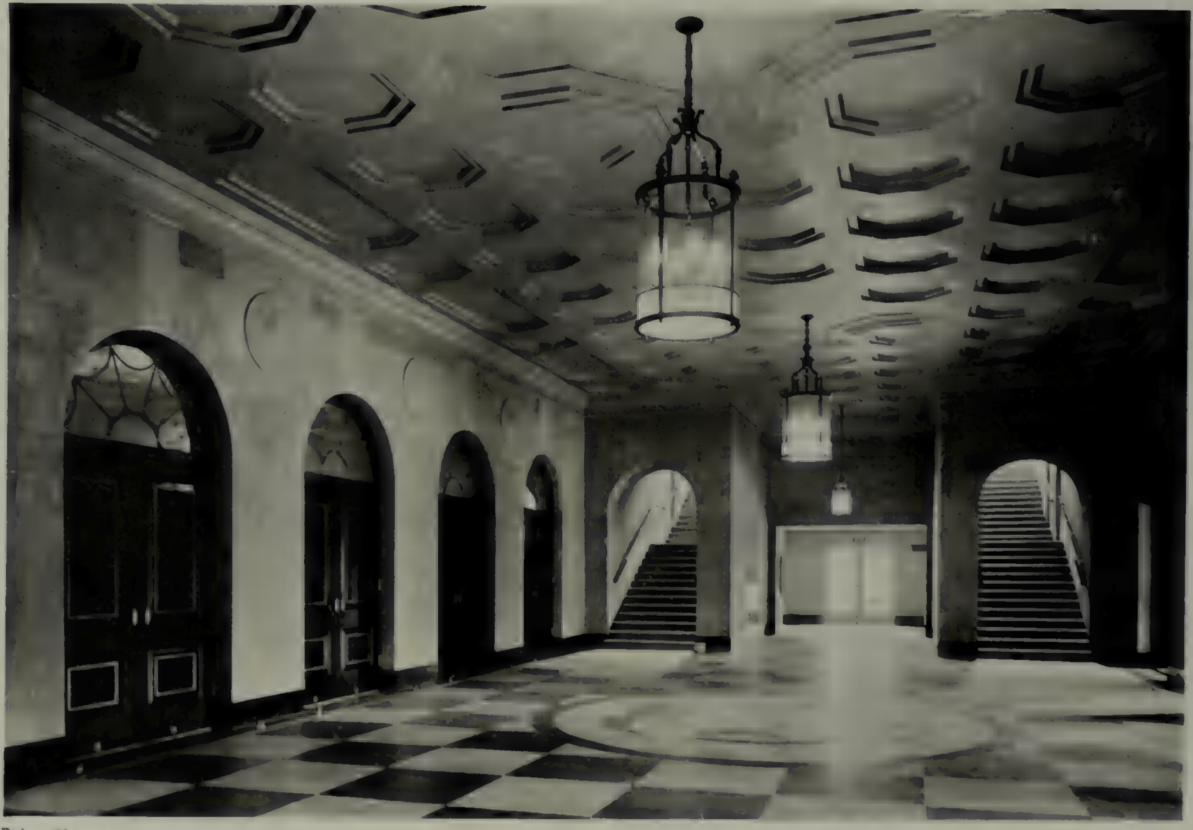

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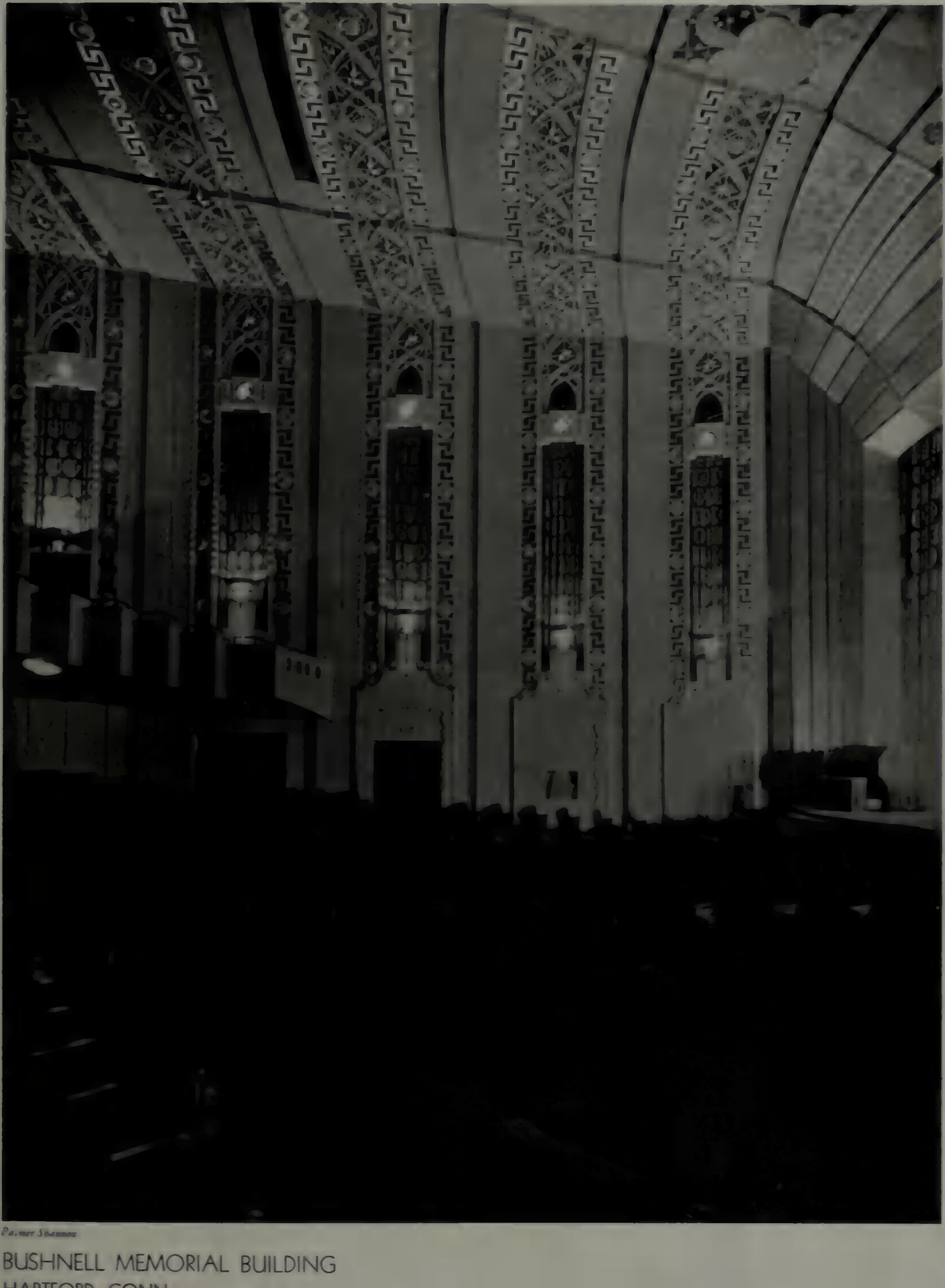

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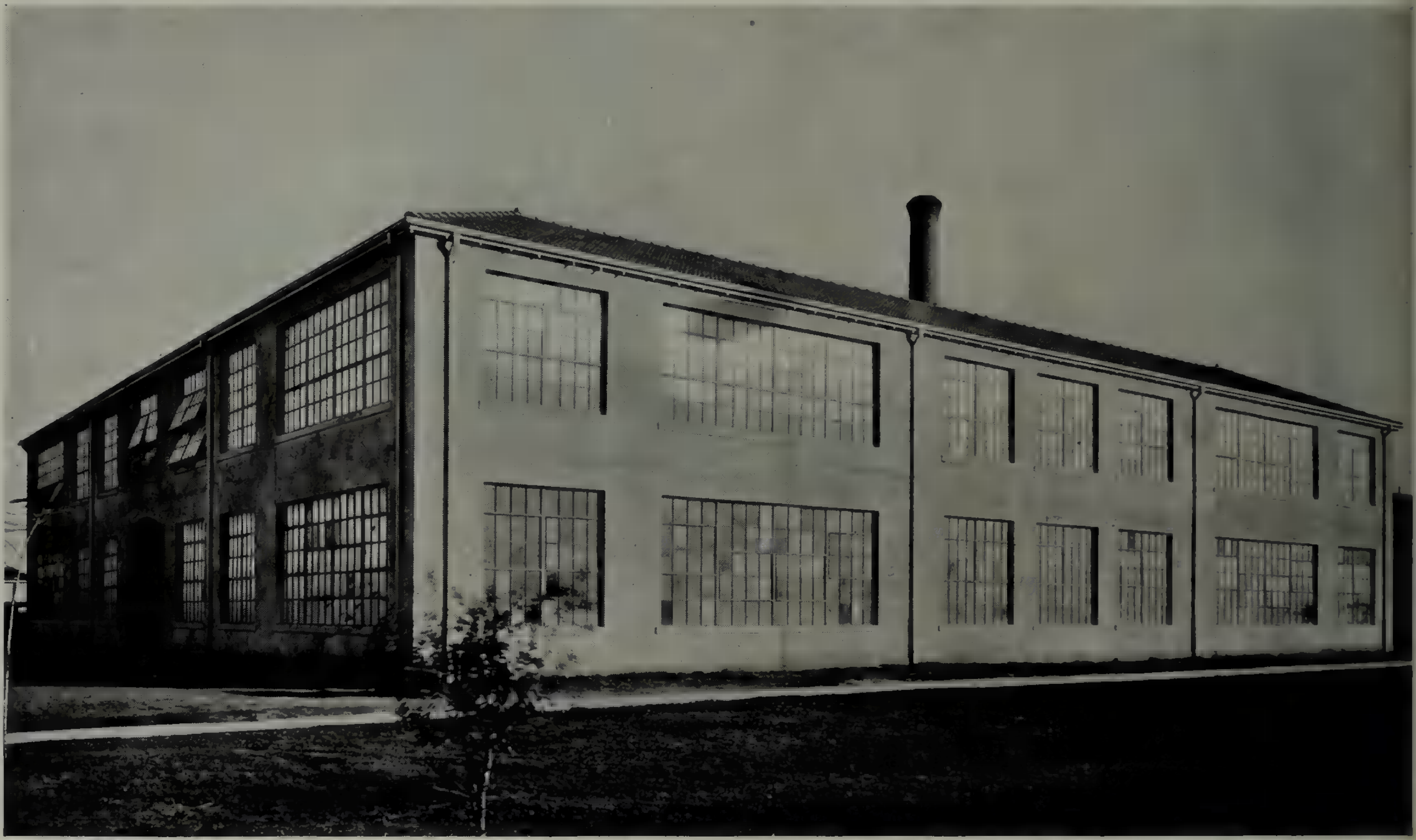
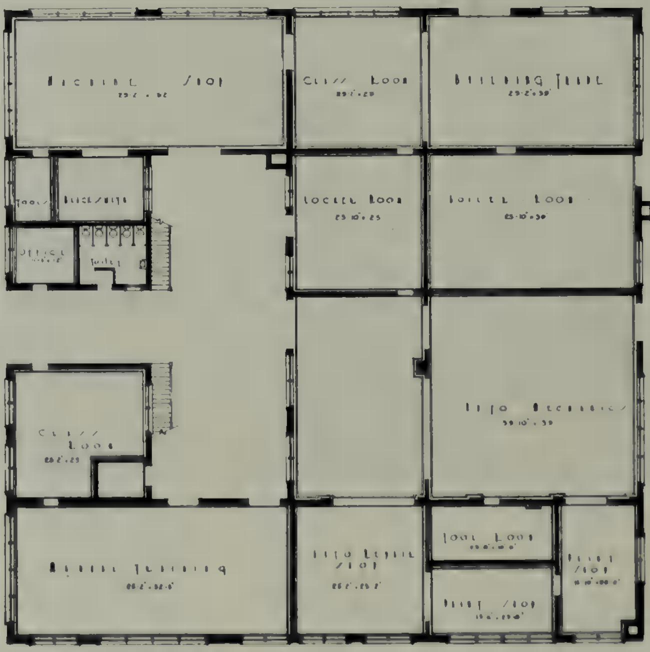
THE SOUTH PARK TRADE SCHOOL

BEAUMONT, TEXAS

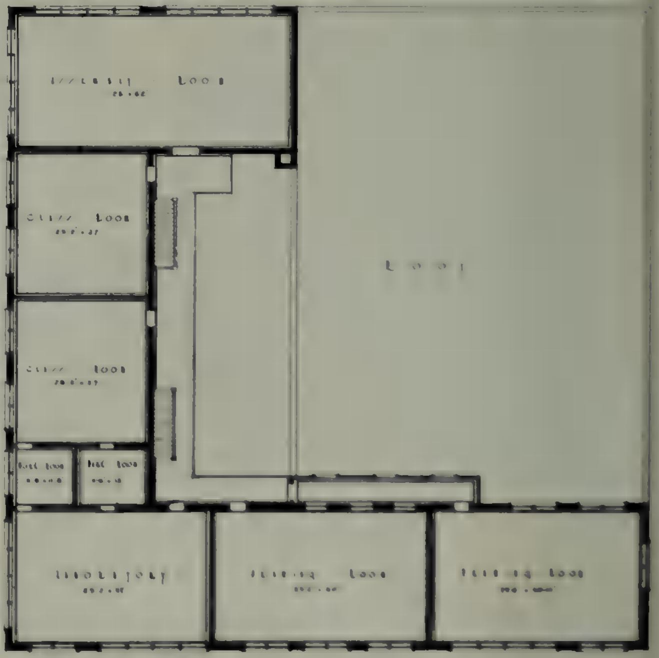
LIVESAY AND WIEDEMANN, ARCHITECTS AND ENGINEERS



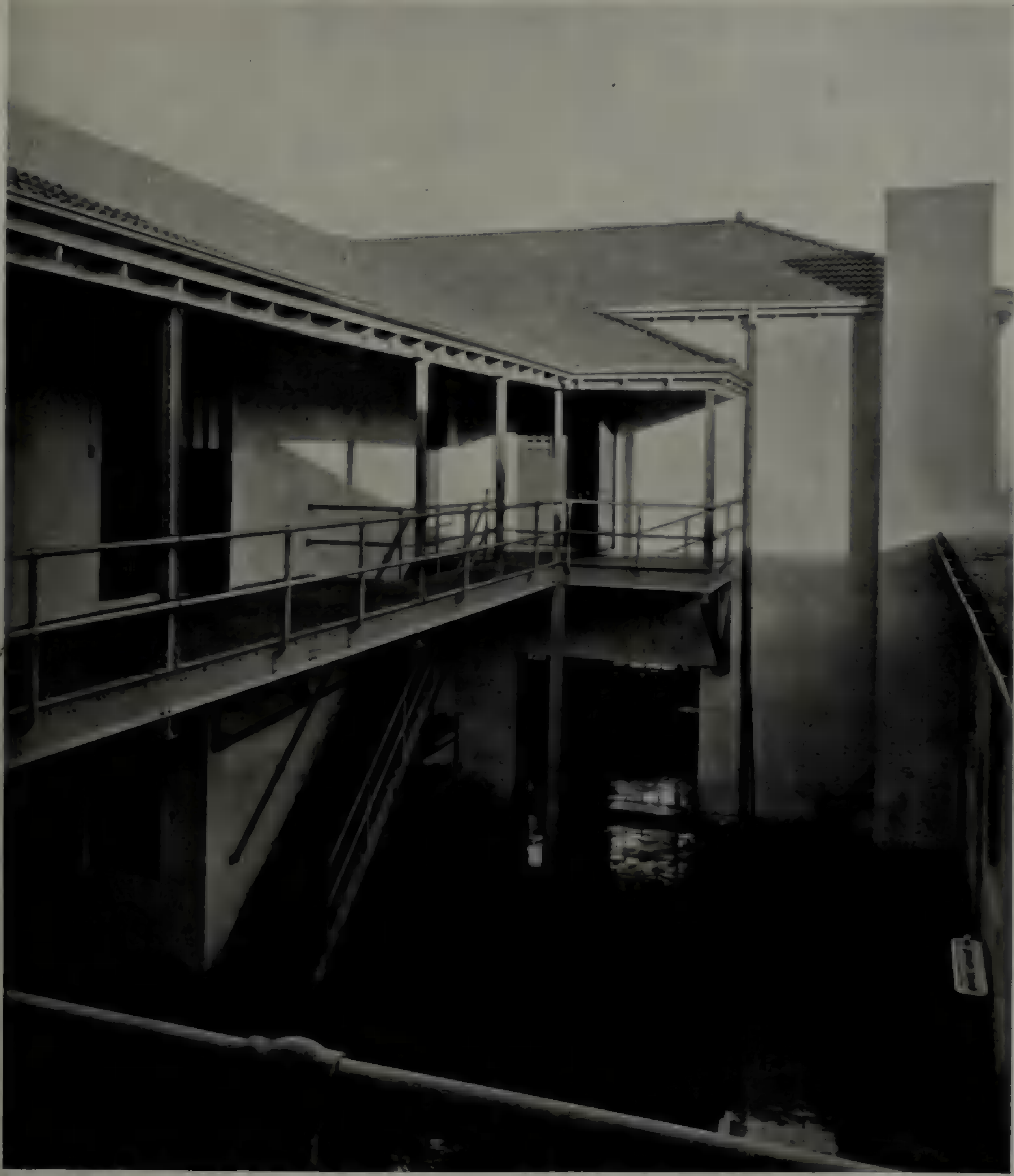
Business Men's Studio



GROUND FLOOR



SECOND FLOOR



Business Men's Studio

SOUTH PARK TRADE SCHOOL, BEAUMONT, TEXAS
LIVESAY AND WIEDEMANN, ARCHITECTS AND ENGINEERS

The school provides facilities for 400 trade students including sixth and seventh grade pupils of a neighboring school who are taking prevocational shopwork. The building has no basement. Shop facilities are on first floor, academic and drafting rooms and laboratories are on the second floor. The large expanse of factory window sash gives exceptionally fine light and ventilation.

A wide entrance gives access to courtyard, stairs and shop, and through it automobiles and delivery trucks can go to the repair and auto mechanics shop. Each main shop has accessories rooms for tools and materials. An assembly room on the second floor, 25′ x 32′, is sufficient for ordinary assembly purposes. Cost of building was $86,659, or 16c a cubic foot.

CAN THE ARCHITECT PROMOTE MORE BUSINESS?

With each recurrent dip in the economic curve, the architect is reminded of the rather slender footing upon which rests the foundation of his service outlet. A well-maintained office of today requires a more or less constant volume of work merely to meet the *overhead*. When the second city of the land recently touched the "low" of $500,000 in total building permits for one of the spring months, we could picture only inadequately the situation in a dozen large architectural offices whose combined overhead must exceed considerably the utmost commissions to be squeezed from such a paltry market. The attention of the profession may well turn from that mass of gratuitous advice of how the architect is to capture for his individual practice the cream of the current business to the question of how to get any business at all. He realizes afresh that his services are dependent largely upon projects promoted by others. Not only does he find himself at a loss to understand or influence the clogged wheels of progress, but in the reduced building market his services are likely to be curtailed as one of the unessential frills which must be dispensed with under the pressure of economic conditions.

Is architecture a luxury or a necessity? If it is unfortunately, and at times unreasonably, classed as the former, to what extent is the architect to blame and what can he do about it? Is he either practically or temperamentally fitted to engage in business promotion? Such promotion, if undertaken, is two-fold: first, in promoting a greater appreciation of his services in a larger part of building work actually carried forward; second, in helping to promote a larger volume of building particularly in slack times such as the present. Both purposes however, are strikingly linked together in actual practice. In order to promote a greater appreciation of architectural service many suggestions have been offered. It is ethically more appropriate and perhaps more effective for architects to proceed as a group or local chapter rather than as individuals, although it will be frankly admitted that the ripening fruits of such promotion are to be gathered individually by social contact with those who represent the credit necessary to float new projects. This popular cause has been neatly paraphrased in the slogan, "Make the Public more Architect-Minded"! The second and more important phase of promotion is the increase of volume of new building. Should architects individually or *en masse* directly undertake to engage in stimulating new construction?

Unquestionably a large amount of promotional work has been done during the recent years of plenty. An examination of the results, however, will reveal that a considerable percentage of this promotion has taken place with little regard for either the actual needs of the various classes of buildings projected or the requirements of the regions to be served. Promotion highly actuated by the need of credit outlets for capital has left in its wake a trail of overbuilding—office and loft buildings here, "high class" apartments there, factories elsewhere.

If the architect had greater opportunity to promote, could he do any worse? Could he even do better? What are his inherent opportunities as an architect?

If we are to "Make the Public More Architect-Minded," it may be in order to suggest that we "Make the Architect More Public-Minded". In serving clients as individuals the architect has come to regard his practice, and with it the welfare of the public, as an essentially individualistic procedure. However, looking back to precedents of great architectural accomplishments (to which we have perhaps too long looked back for stylistic inspiration), do we find these accomplished by individual initiative? Some perhaps, but for the most part they represent community action. Even where the will to create has been centered in the monarch or despot the building has been accomplished through mass belief that it was of value to more than the immediate generation.

Is the appeal to the individual home interest, on which so large a part of our recent promotional effort has been centered, the only "prime mover" on which modern progress can depend? Acquire a home and then realize the deficiencies if your environment has been the unfortunate experience of countless thousands during the past generation. Here is a single problem about which more muddled agitation has been taking place than perhaps any other. Not only is it large enough to occupy a considerable part of the thought of the profession, but it represents by far the largest block of normal building construction and probably the smallest percentage of architectural participation. Some advance may be shown by statistics over the past ten-year period, but does it yet represent more than a fraction of its possible importance to the architect or his possible contribution to the community?

In the recent announcement of a Washington conference on home building there is an indication of some appreciation of the importance of city planning and contingent factors, yet the emphasis has been centered largely on better financing. No one will deny the importance of credit in stimulating home building, but if credit is merely to add more rows of flimsy, monotonous houses to those unfortunate border communities, which remain to us from the great land booms of 1922–26, we could almost wish that such credit might be suppressed. Only one worse fate could be imagined, that new home-owning agitation may again be used as a cloak to open up more miles of unused vacant lots or sparsely populated wastes of cement sidewalks and rusting utility pipes of which we have acquired enough to satisfy even the most ardent expansionist. Here is a study in regional needs as well as in the changing habits and requirements of the normal family which might well occupy the enforced leisure of local groups in the profession and which, if intelligently directed, might bring forth concrete suggestions, which could be put into operation as a result of the projected conference.

There remains a third factor to the present dilemma. To what extent is standardization and the constantly increasing size of individual projects reducing the quantity of architectural service in relation to the volume of building? If, as it is claimed, one single building now under construction in New York City will furnish the total amount of new office space needed to meet one year's normal business growth, is this trend favorable to professional prosperity? Granted the inspiration and satisfaction in the fact of doing well a gigantic structure, does not this great pile, even with its lobby and significant bronzes, represent more uniformity than a dozen equally simple and effectively designed structures representing a corresponding total expenditure? This is suggested only as an abstract speculation, which, however, might lead the Institute through an active committee to discover over a period of years some of the economic principles which should underly the disposition of commercial structures in relation to eventual civic economics. We may safely take the chance that these will vary from the current deduction of minimum skyscraper sizes based upon the immediate relation of rentals to existing land prices in large cities. However, we may inquire to what extent the architect heedlessly falls into the general movement toward bigger and therefore "better" buildings. I have in mind a certain commission for the building of a large private school in which working plans were under way for a single main building containing a multitude of halls and stairways, when one of the designers suddenly had a "hunch" that a series of smaller units would be more economical and practicable. The result was a far more satisfactory and interesting project fitted with much painstaking care into a difficult though effective site. The architects were required to perform a greatly increased amount of service in relation to the total expenditure, although the latter was probably less in actual dollars and certainly much less in relation to usage value in the conduct of the school than would have been the case if the building had been completed under the more stereotyped design. Although such services might not prove normally advantageous under minimum ethical charges, I leave to the reader the question to what extent the architect may profit over a period of years by contributing more generously not only to that side of planning which can be expressed in terms of design and specification, but also to that equally important field related to the basic needs of humanity in which he will scarcely duplicate the efforts of those engaged in the more usual channels of promotion.

Henry Wright

HOW ARCHITECTS MAY CULTIVATE BUSINESS

VALUE OF ARCHITECT MEASURED BY SERVICE

The cultivation of business for the architect resolves itself into a scientific study of what the architect can do. In many instances the failure of architects to attract new business is due to a lack of organization or insufficient consideration of the variety of services which an architect could and should render. Investigation will indicate that architects who are achieving an increase in business are the aggressive individuals who seek out their commissions. They investigate and develop new enterprises with all the energy and accuracy that modern business practice makes possible. They establish confidence by the success of their completed buildings—a success that is more often practical than esthetic. In the development of their projects they assure themselves and their clients that the venture is financially justified. They take a cue from the business man and the manufacturer and realize the value of exhaustive preliminary research study of the client's problems in the light of facts scientifically gathered.

MEASURING THE NEED FOR ARCHITECTURE

In order to render a wider and more general service the architect must thoroughly understand his locality, whether large or small and also the potential demand or necessity for new buildings and building enlargement.

STUDY OF COMMUNITY

Determine the potentialities for constructive improvement and consequently for commissions. Of even more importance, assume a leadership in shaping the community growth by informed acquaintance with all the factors that make for better city growth and improved planning and design of buildings.

It is imperative that the architect should undergo a period of educational preparation under the following items:

1. *Study the existing plan of his community.* He should acquaint himself with the latest practice in town planning abroad and in America. He should undertake the preparation of a scheme of town development.

2. *Study present and past building progress* in the locality and elsewhere so as to anticipate need for stores, offices, schools, churches, garages, civic improvements. He will find that a growing section gives promise of increasing building needs, while a section that is decreasing in population is ordinarily oversupplied and requires few improvements.

3. *Survey housing requirements* in order to determine housing needs or excess.

4. *Study population movements.*

5. *Survey labor and building materials costs.*

6. *Acquaint himself with transportation facilities and needs* in relation to city growth. The traffic problem, allied to transportation, is one of the most serious and important of problems confronting city governments; and there is no group of persons more concerned in the need for traffic improvement and its relation to building than architects.

7. *Study and endorse improved planning of houses and other buildings* for greater convenience and improved health.

8. *Study and endorse newer construction methods and new materials if better.*

SERVICES WHICH AN ARCHITECT SHOULD RENDER

1. Assume a leadership in civic affairs.

2. Sponsor zoning that will contribute to a systematic and balanced growth of the city.

3. Serve as advisory architect to community, to industry, banks, corporations and individuals.

4. Master requirements of all city, county and state ordinances as they apply to building, health and fire protection.

5. Prepare financial "set-ups" for clients to ensure security of building investment.

6. Prepare plans and specifications.

7. Make exhaustive investigation of the use of a site or development of plans to ascertain all possibilities for the utmost success of undertaking.

8. Supervise construction.

PROMOTION

Here are some of the methods in common use by architects in getting business:

1. *Influential social connections*, political friendships, financial interest (owning stock in corporation concerned in building).

2. *Firm prestige*, successful outstanding buildings.

3. *Direct solicitation.*

4. *Follow-up of former clients.* The successful accomplishment of buildings for clients may prepare the way for new projects, additions, or recommendation to other clients.

5. *Leads from real estate brokers.*

6. *Specialization.* Building up a reputation on a type of building such as schools, churches, residences, hotels, loft buildings. The leadership of such an architect will be based on experience, lower cost due to quantity of construction and shortcuts acquired by experience. It is easier to solicit and gain commissions on the basis of work done. Specialization makes for greater efficiency in layout.

There are disadvantages in specialization, such as fluctuation in demand for buildings of one type, resulting in costly lulls. Office force trained in one specialty will show less competency in a new field.

7. *Use of construction reports.* The announcements of new projects are sometimes made before an architect is selected and may by direct solicitation lead to commissions.

8. *Personal promotion of projects* in cooperation with others. Apartment houses, office buildings, residential subdivisions are sometimes developed and partly financed by architects.

9. *Advertising services of architects* in a locality. The primary purpose of cooperative advertising is to promote education of the public as to the value of the architects' services.

10. *Competitions.* The winning of competitions may mean recognition of ability and other jobs.

11. *Remodeling of abandoned or rundown properties*, with modernization of utilities and improvement of plans and exteriors.

12. *Group practice.* The unified efforts of architects have frequently been successful in acquiring school and public improvement projects. Architects have come to realize that the prosperity of the individual depends in a large measure on the prosperity and energy of the group.

13. *Restudy of abandoned schemes* with a

better solution or a more economical system of construction or finance.

14. *Sponsoring new buildings* in a community where investigation discovered the need for such buildings. The success of a type of building in a neighboring community has sometimes suggested the desirability of a similar building in the architect's locality.

A. Lawrence Kocher

CASES:

HOW ARCHITECTS DEVELOP BUSINESS

BUSINESS ANALYSIS

Example: *Shreve, Lamb and Harmon, architects.*

Success, according to this architectural firm, means proven ability not only to design and build but also to conceive and execute the entire project in a *profitable* manner.

Preliminary designs by this architectural firm are done on the typewriter as well as on the drafting board. The client's problems are ascertained and analyzed: value of property, preferences for certain types of office space in particular localities, probable rental value of floor space as determined by the owner or his rental agent, set-back requirements and similar factors are considered. Given the cost of the plot and the rental demanded, the architects analyze the ratio of floor space to plot area required to return the desired income, making due allowances for financing, initial vacancies, maintenance, et cetera.

The extent of this procedure is illustrated by Mr. Shreve's answers to questions asked by newspaper reporters as to what materials would be used for the exterior and where the entrance would be in the new Empire State building. In each instance Mr. Shreve replied that he did not know and bringing out a typewritten sheet with a column of figures, and remarked, "This is the design for the building."

This procedure of designing an income-producing building for office space, according to Mr. Shreve, has not always been the point of view of the architect. A sound analytical approach to any architectural problem is more important than specialization in any one type of architectural work, he believes. The technique applied to analyzing an office building can also be used in designing a school building, a library or a bank.

ALTERATIONS OR NEW BUILDING?

Example: *Robert D. Kohn, architect.*

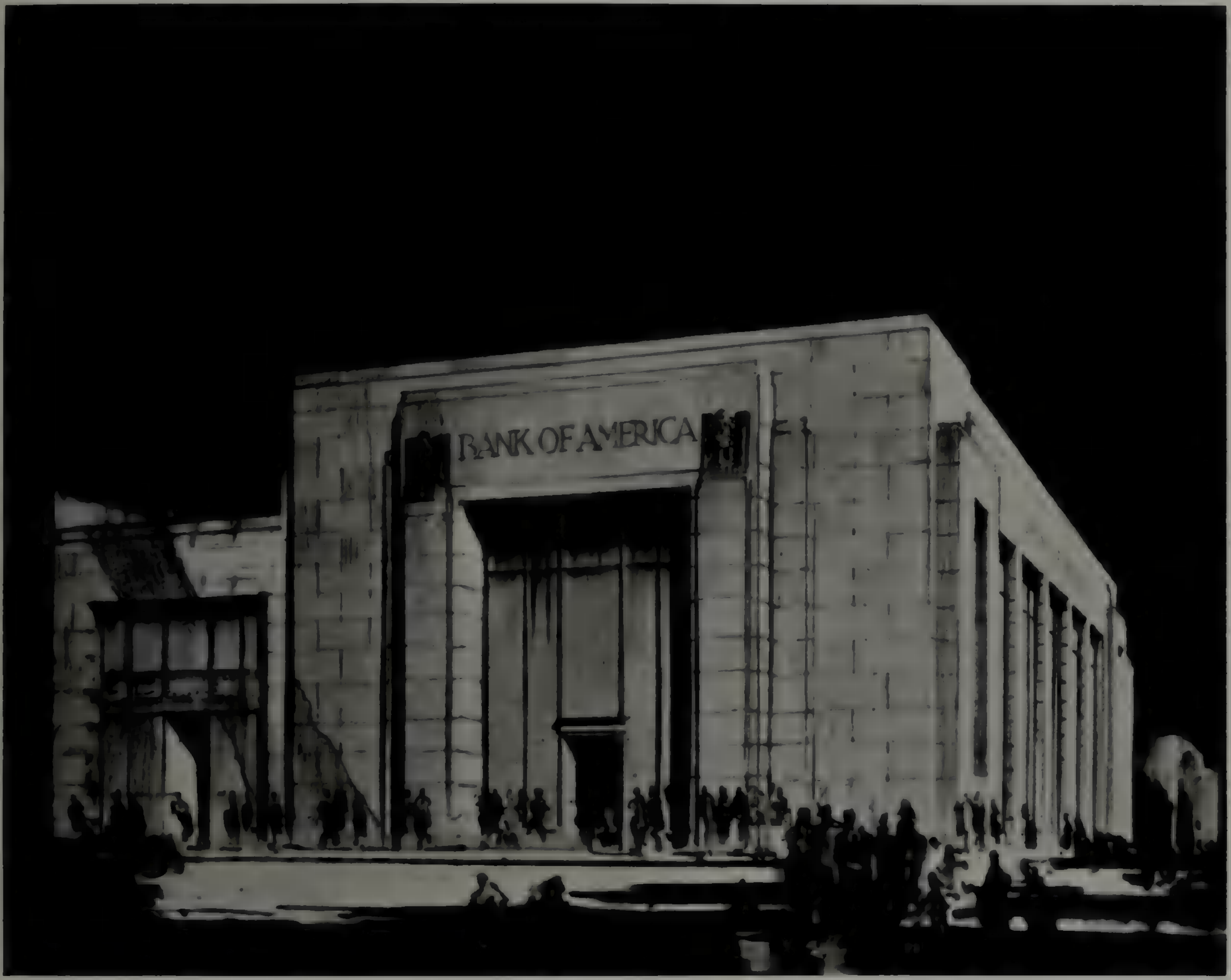
It is essential for the architect, according to Mr. Kohn, to be able to reduce the cost of a new building to terms of yearly carrying or rental charges.

In the case of Macy's Department Store, the owners wanted a recently acquired building remodeled and connected with their existing store. Mr. Kohn made sketches and estimated the cost of doing this work. At the same time he prepared sketches and cost estimates for a new building. Both estimates were reduced to an annual carrying charge or rental basis and showed the owners that it would be possible for them to have a new building which would eliminate objectionable features, such as exposed sprinkler systems and differences in floor levels between the two buildings, for an additional yearly carrying charge of 60 cents a square foot. With the proposition submitted in this form the owners decided to construct the new building.

Mr. Kohn emphasizes the necessity of architects being able to estimate correctly the cost of a job so that the client will not be annoyed in meeting a final bill much higher than anticipated. A fairly accurate cost estimate can be prepared in cooperation with contractors and an allowance added for contingencies.

R. L. Davison

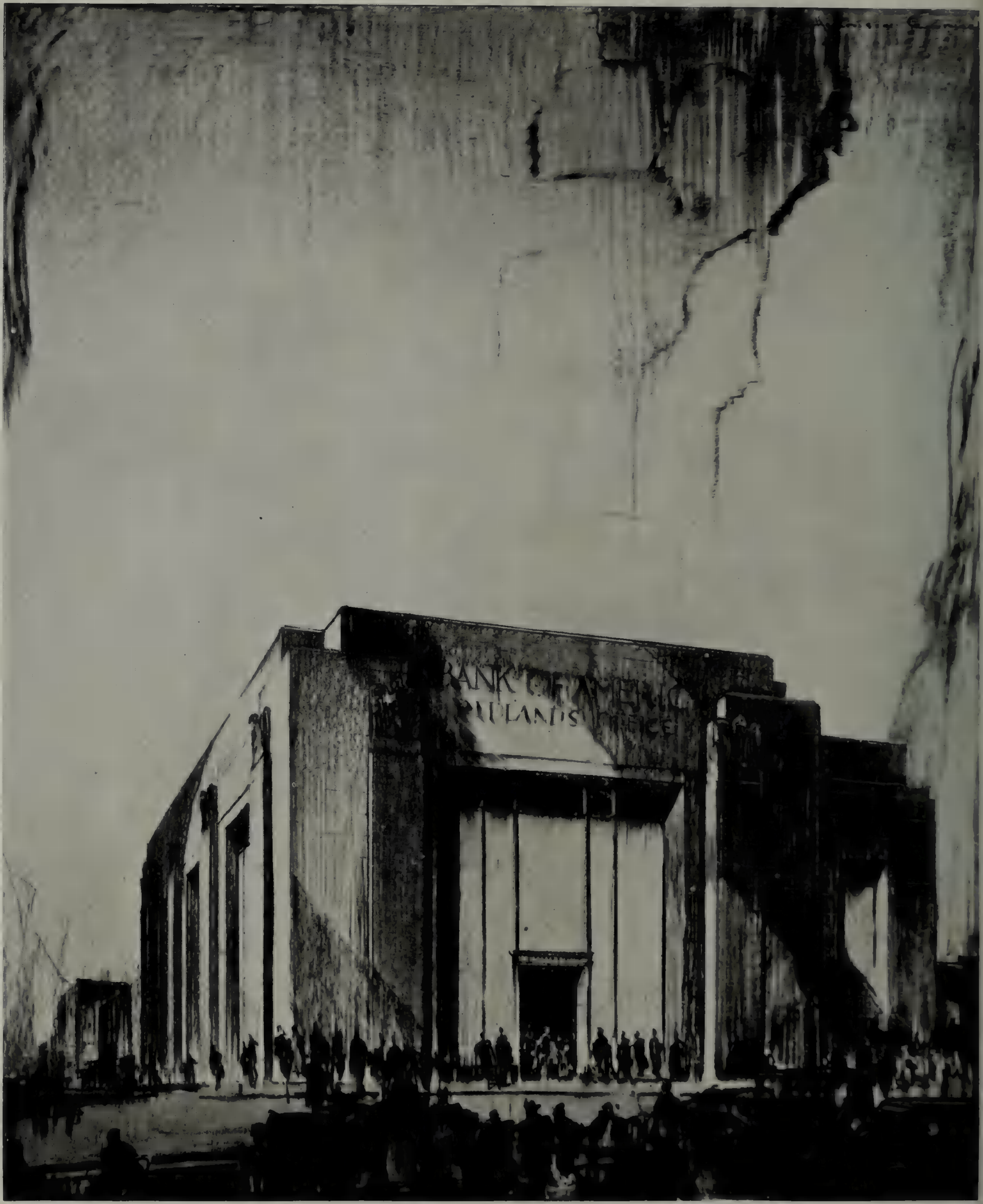
PORTFOLIO OF BANKS



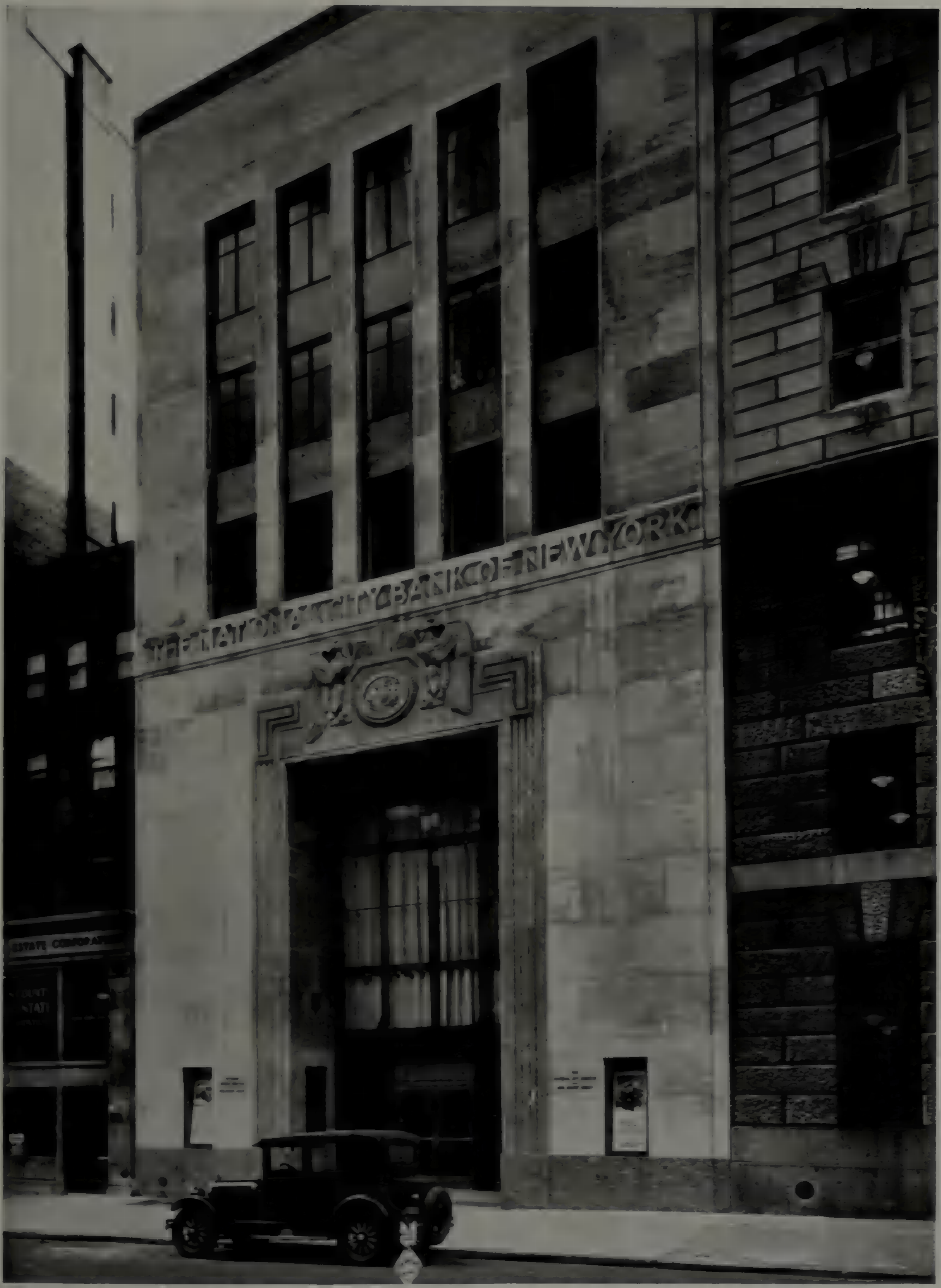
BANK OF AMERICA
BAKERSFIELD, CALIF.
SWASEY AND HAYNE, ARCHITECTS

BRANCH BANKS

Examples of banks in this PORTFOLIO have been chosen for their suitability to the chain bank system. Similarities in treatment of exteriors, whether in this country or in Panama or South America, are readily apparent. Plans, however, differ for the different requirements of the branch banks.

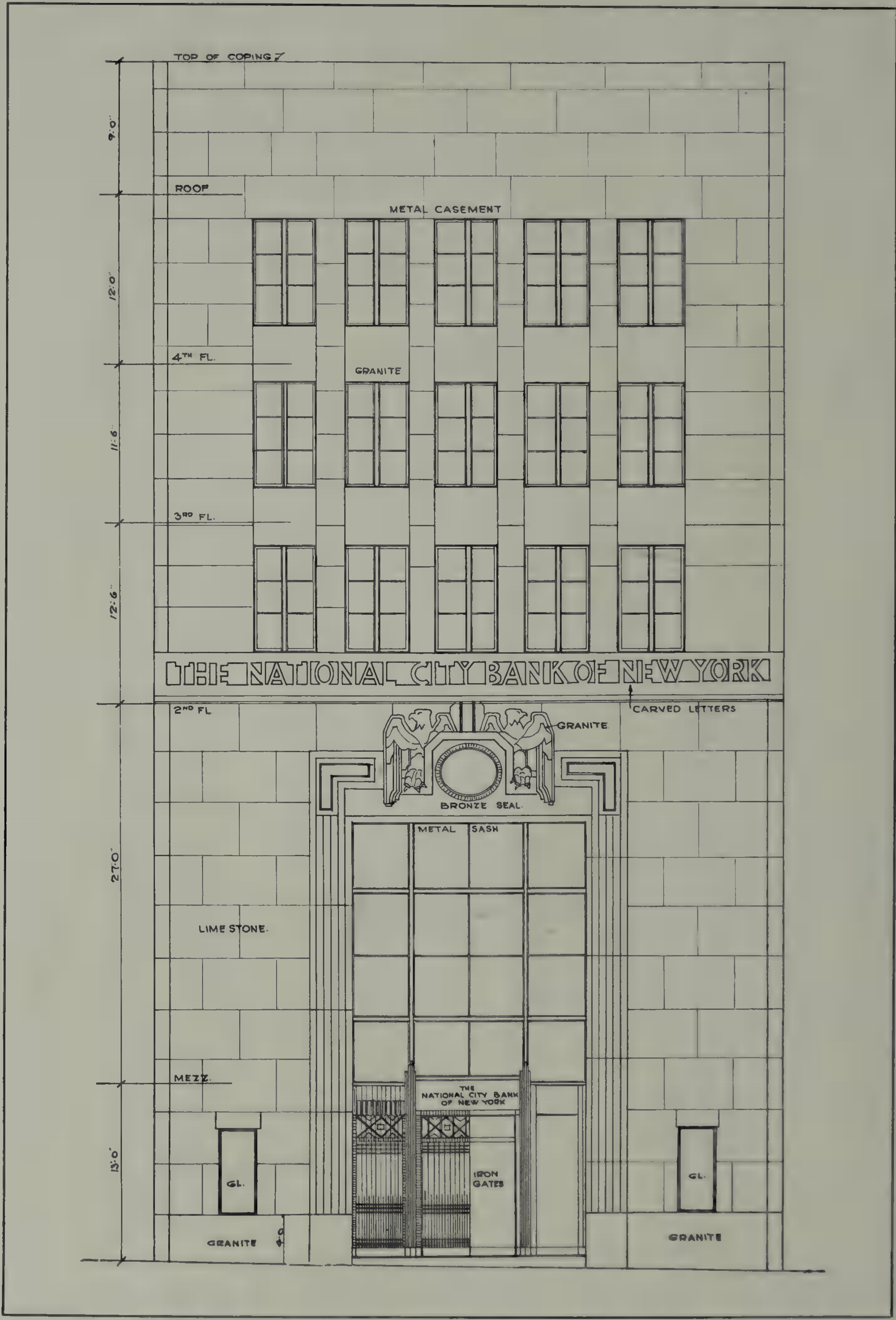


BANK OF AMERICA
REDLANDS, CALIF.
SWASEY AND HAYNE, ARCHITECTS



Gillies

NATIONAL CITY BANK OF NEW YORK
BROOKLYN, N. Y.
WALKER AND GILLETTE, ARCHITECTS



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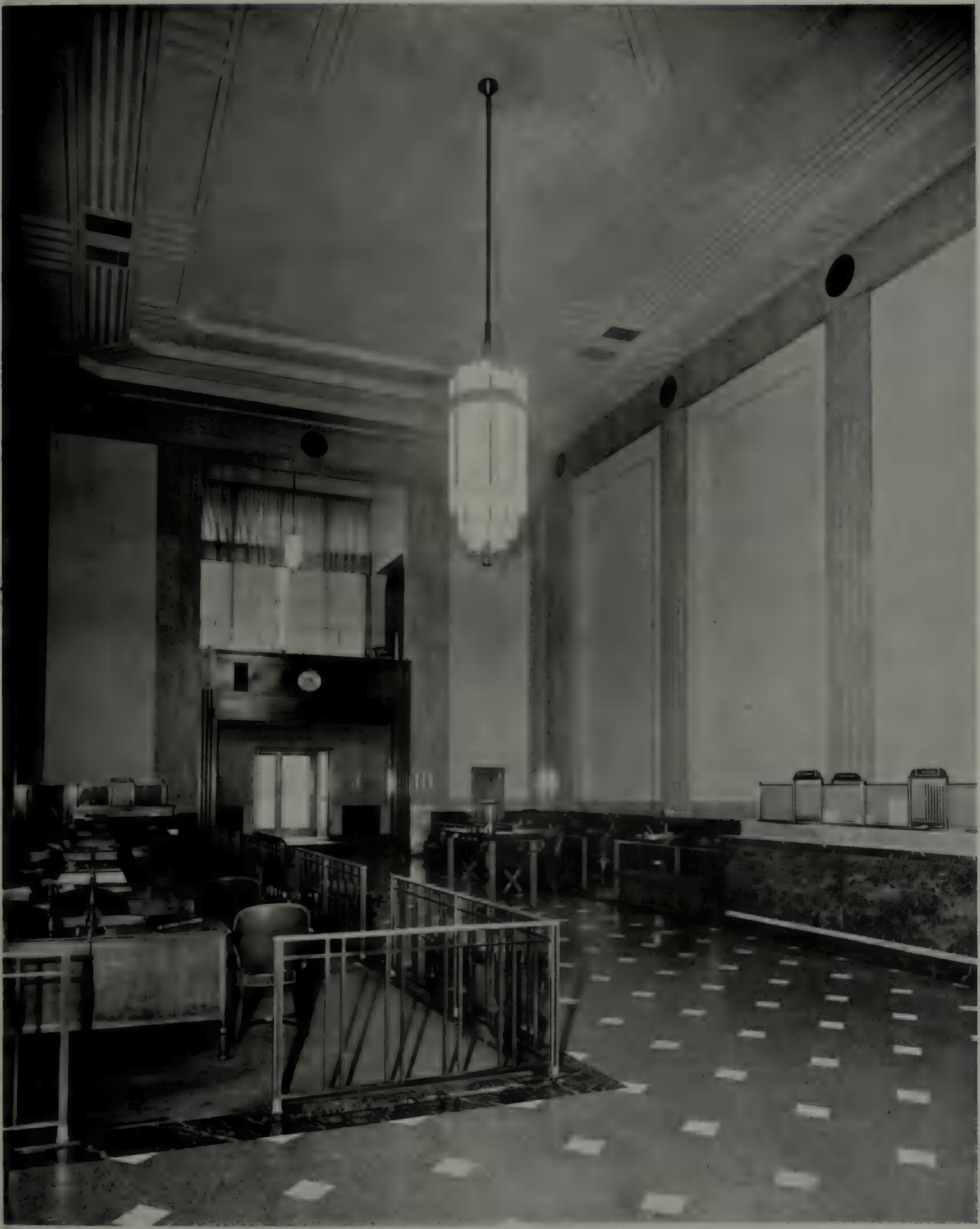
BROOKLYN, N. Y.
WALKER AND GILLETTE, ARCHITECTS

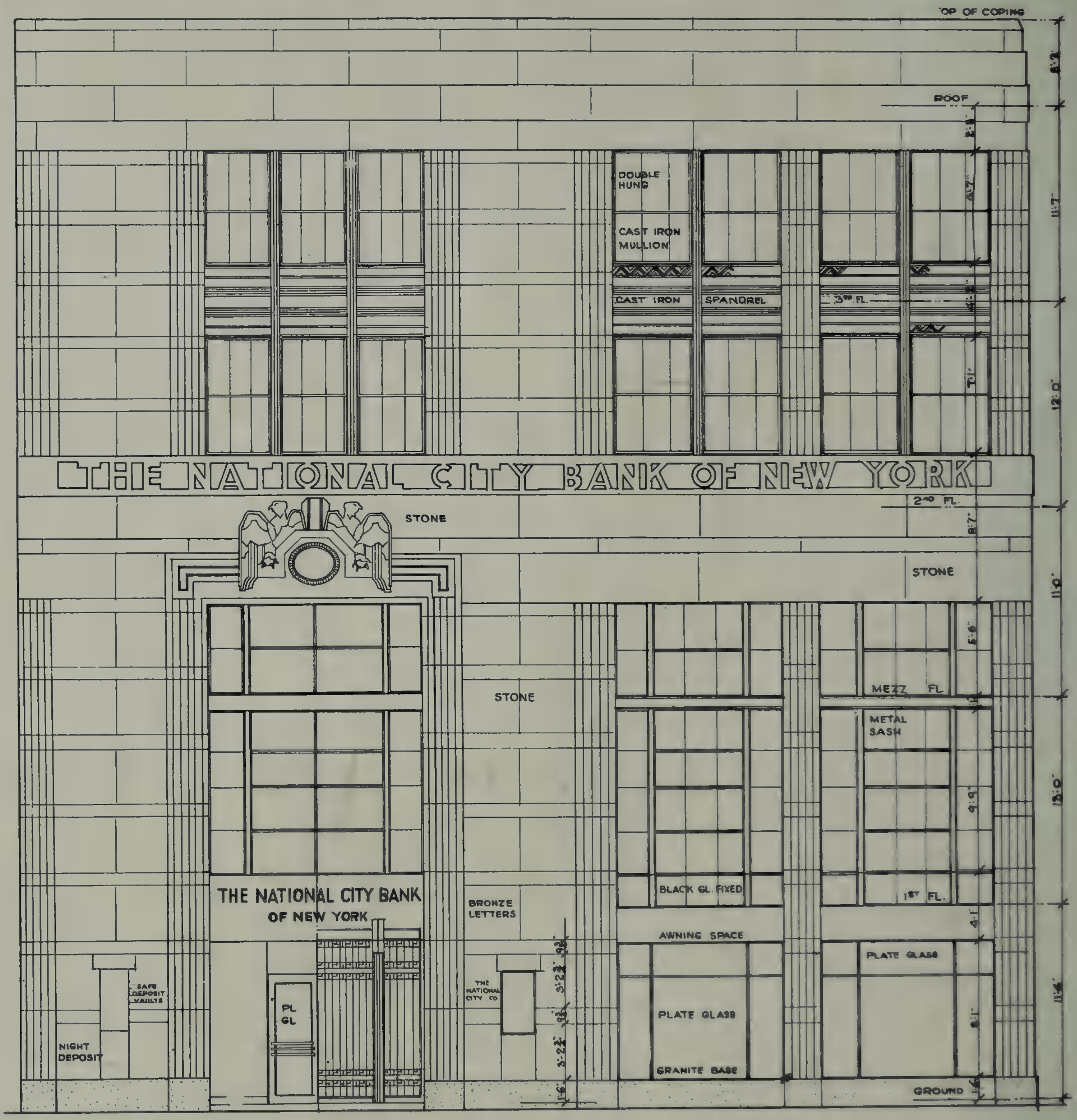


Gillies

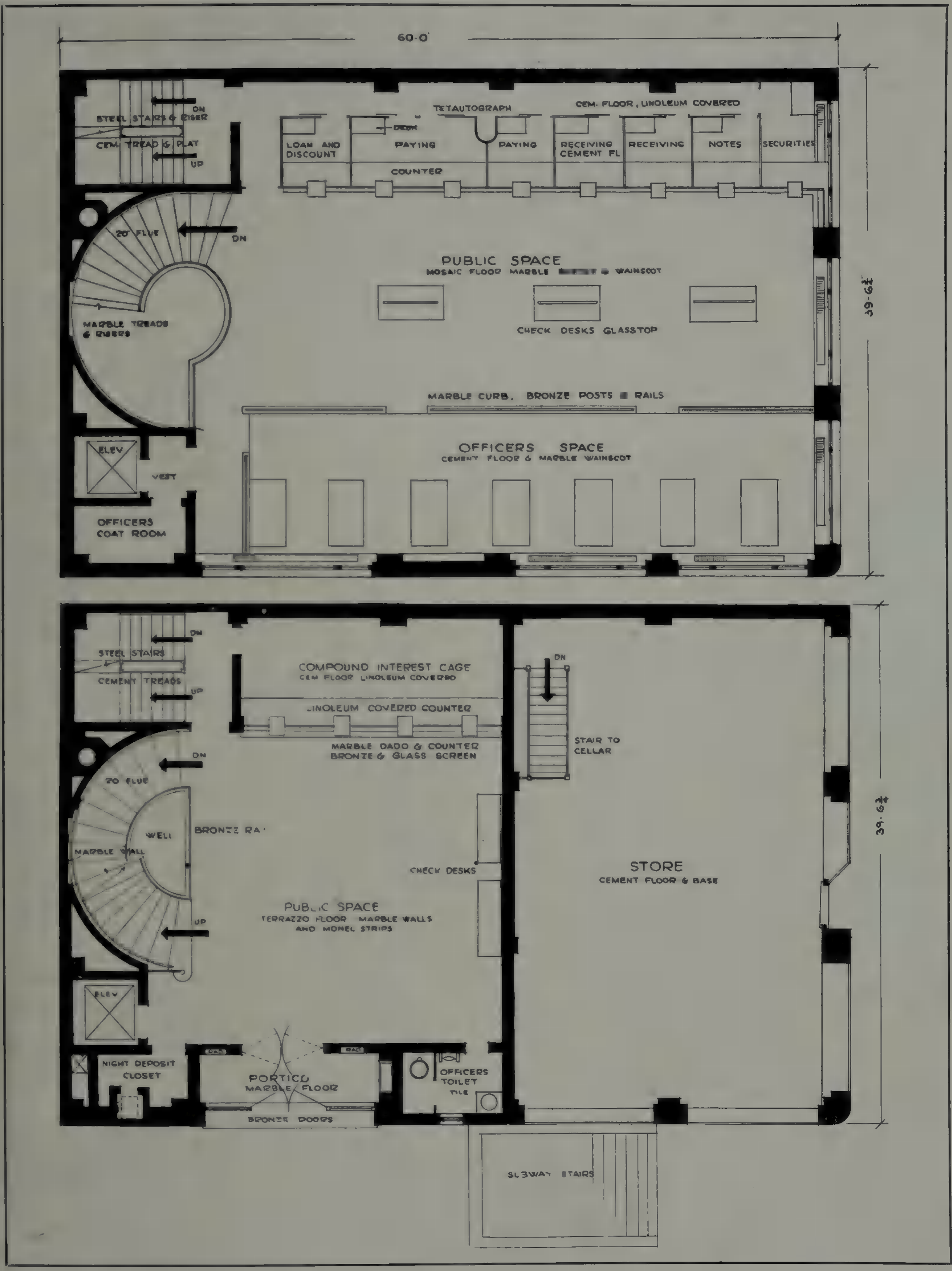
NATIONAL CITY BANK OF NEW YORK
BROOKLYN, N. Y.
WALKER AND GILLETTE, ARCHITECTS

ELEVATION DRAWING
34TH STREET FACADE

Bank occupies upper floors and only part of ground floor, the remainder of this space yielding additional rental from shops on 7th Avenue.



NATIONAL CITY BANK OF NEW YORK
34TH STREET AND 7TH AVENUE, NEW YORK
WALKER AND GILLETTE, ARCHITECTS



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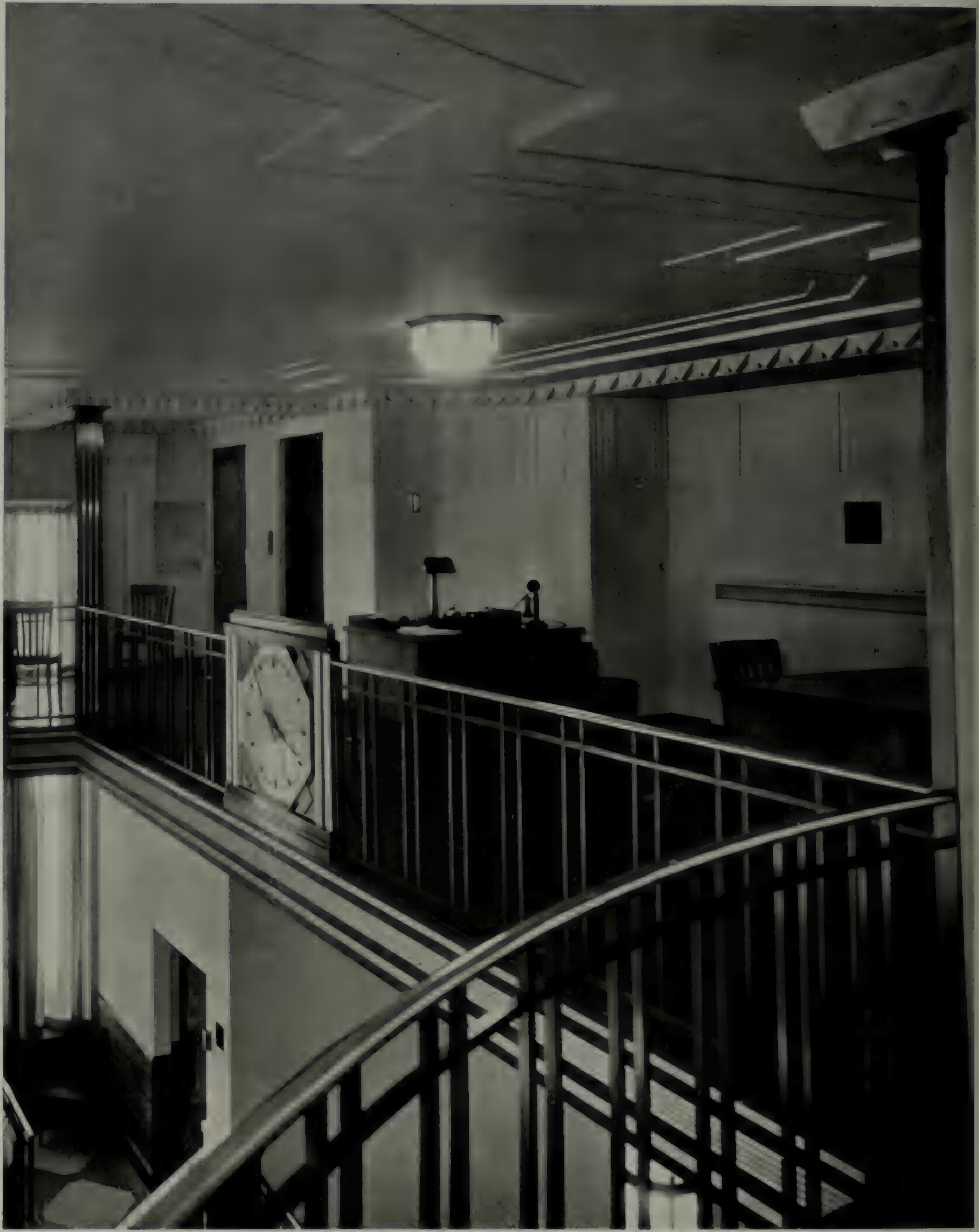
34TH STREET AND 7TH AVENUE, NEW YORK
WALKER AND GILLETTE, ARCHITECTS



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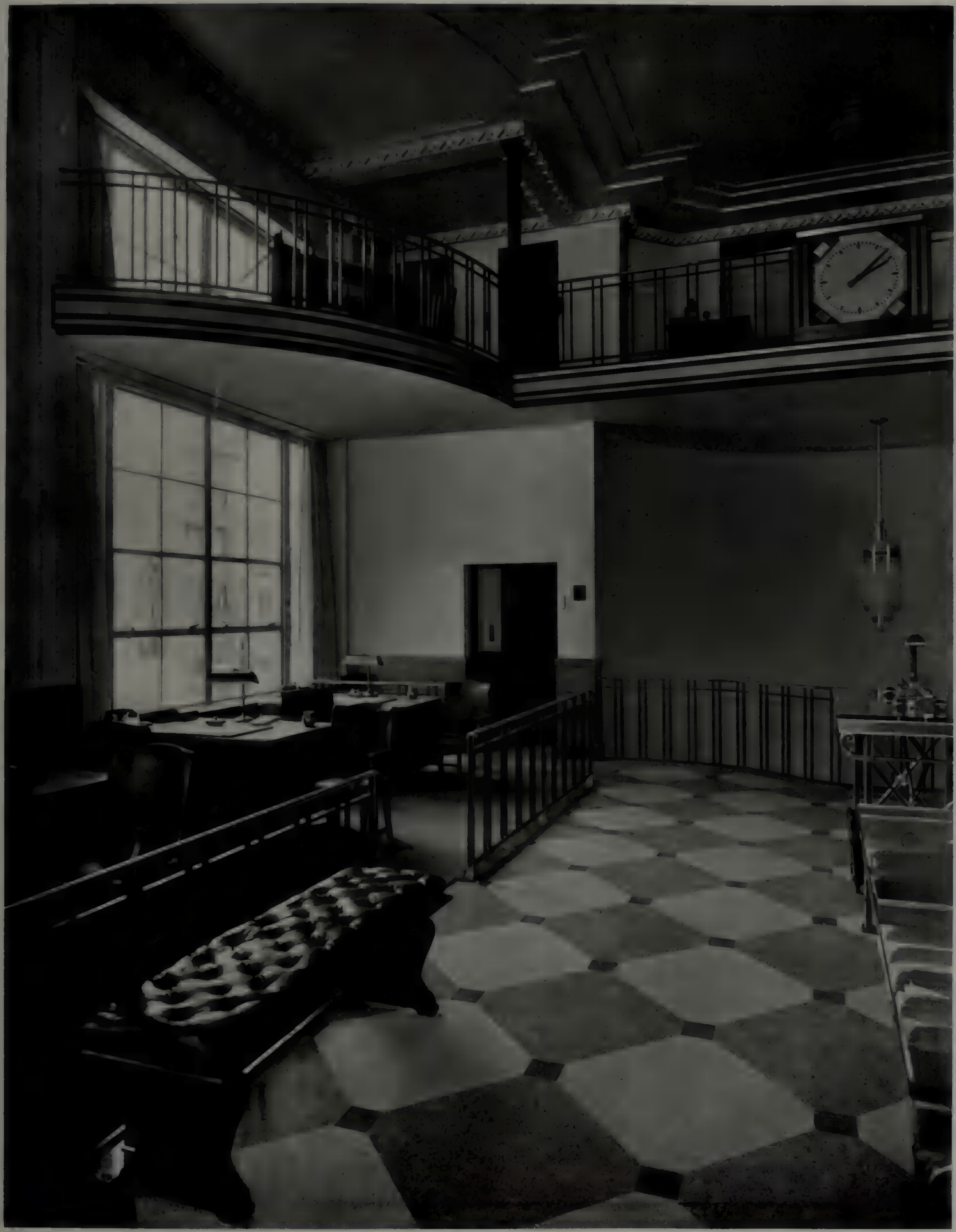
WALKER AND GILLETTE, ARCHITECTS



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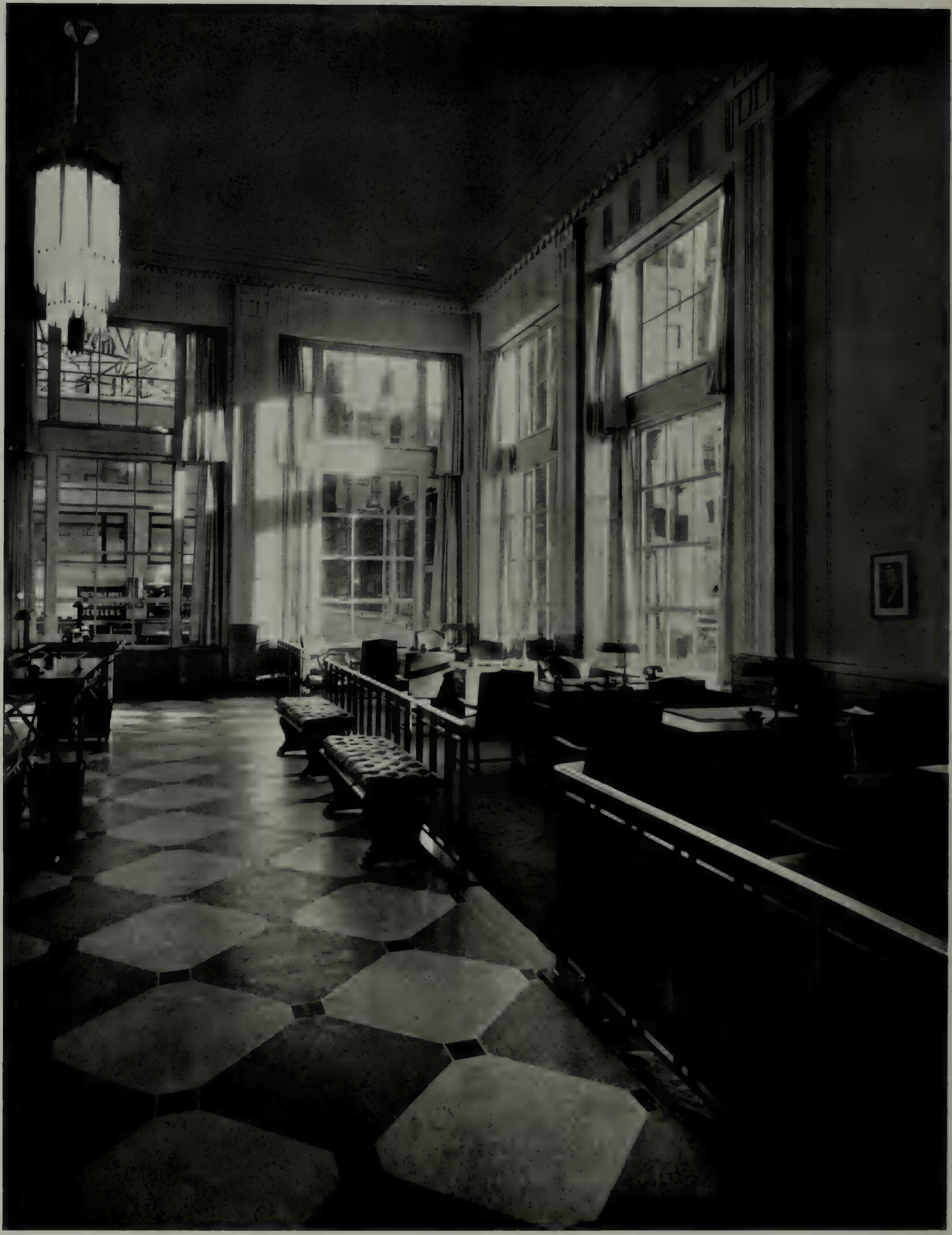

Gillies

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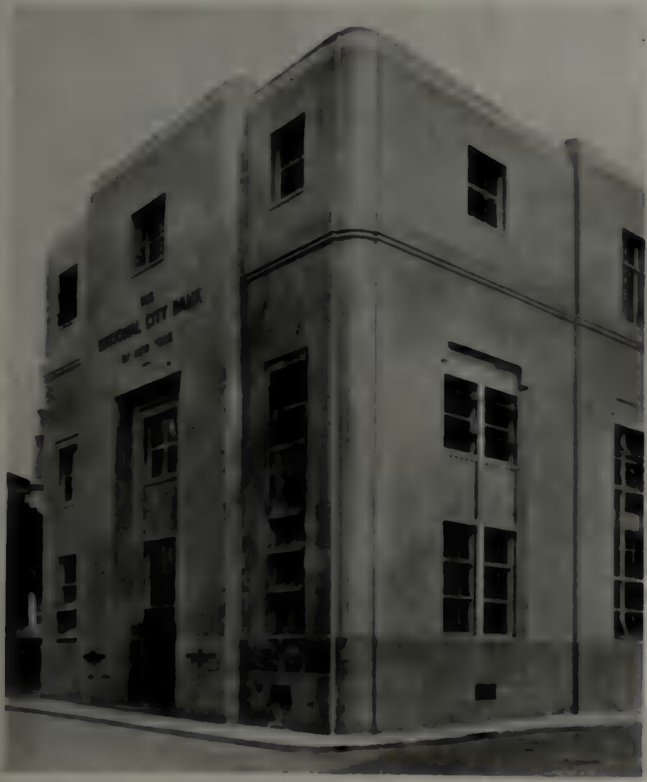
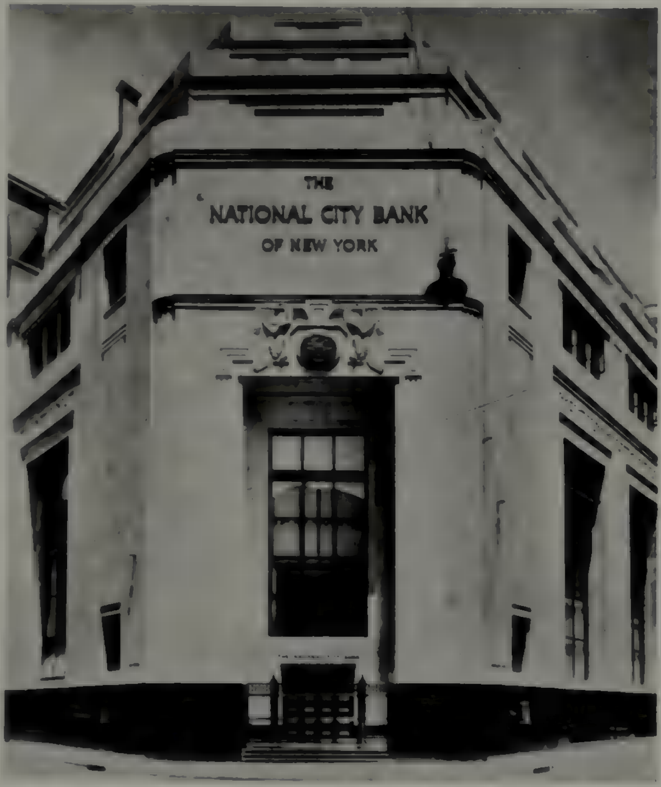
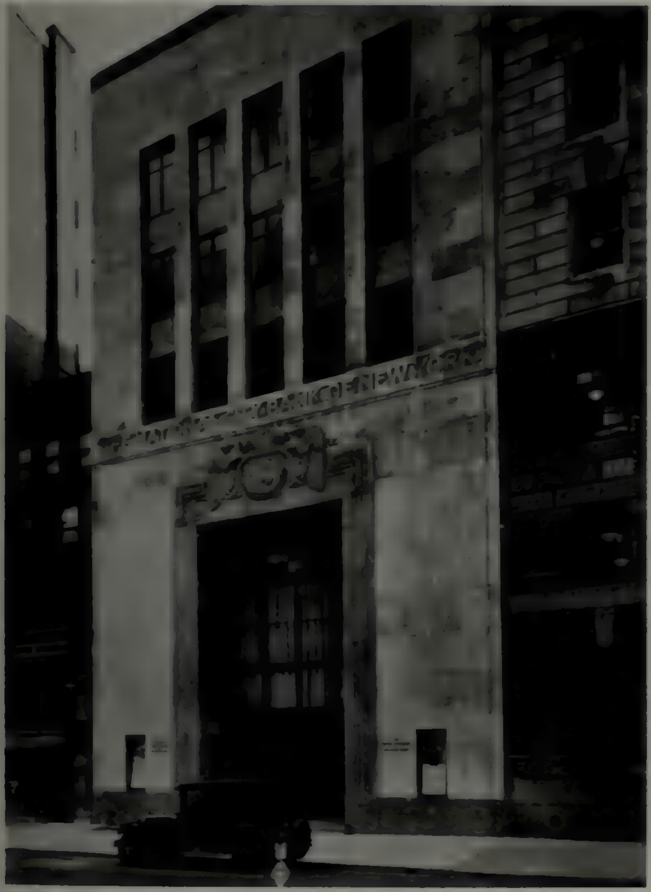
34TH STREET AND 7TH AVENUE, NEW YORK
WALKER AND GILLETTE, ARCHITECTS



PANAMA BRANCH

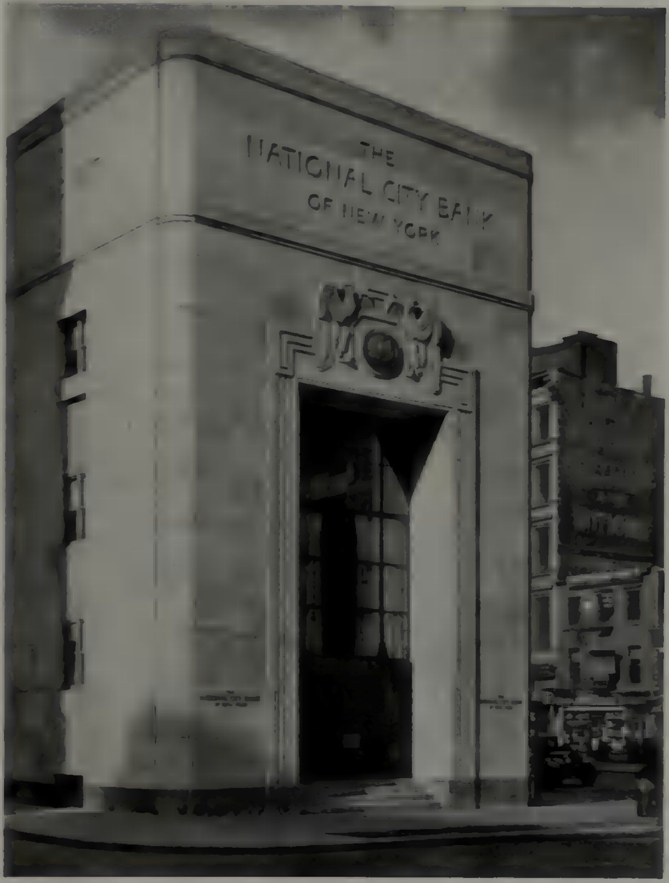


BUENOS AIRES BRANCH



Gillies

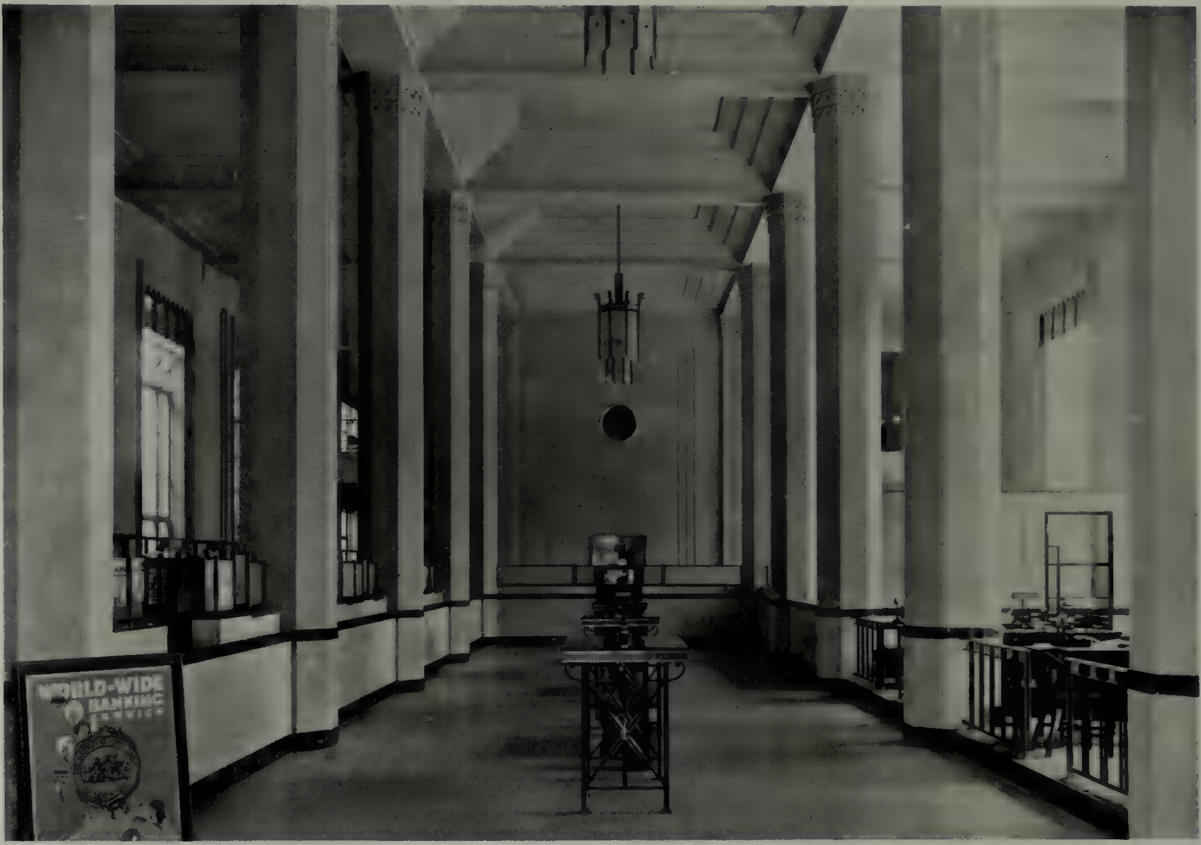
BROOKLYN, N. Y., BRANCH



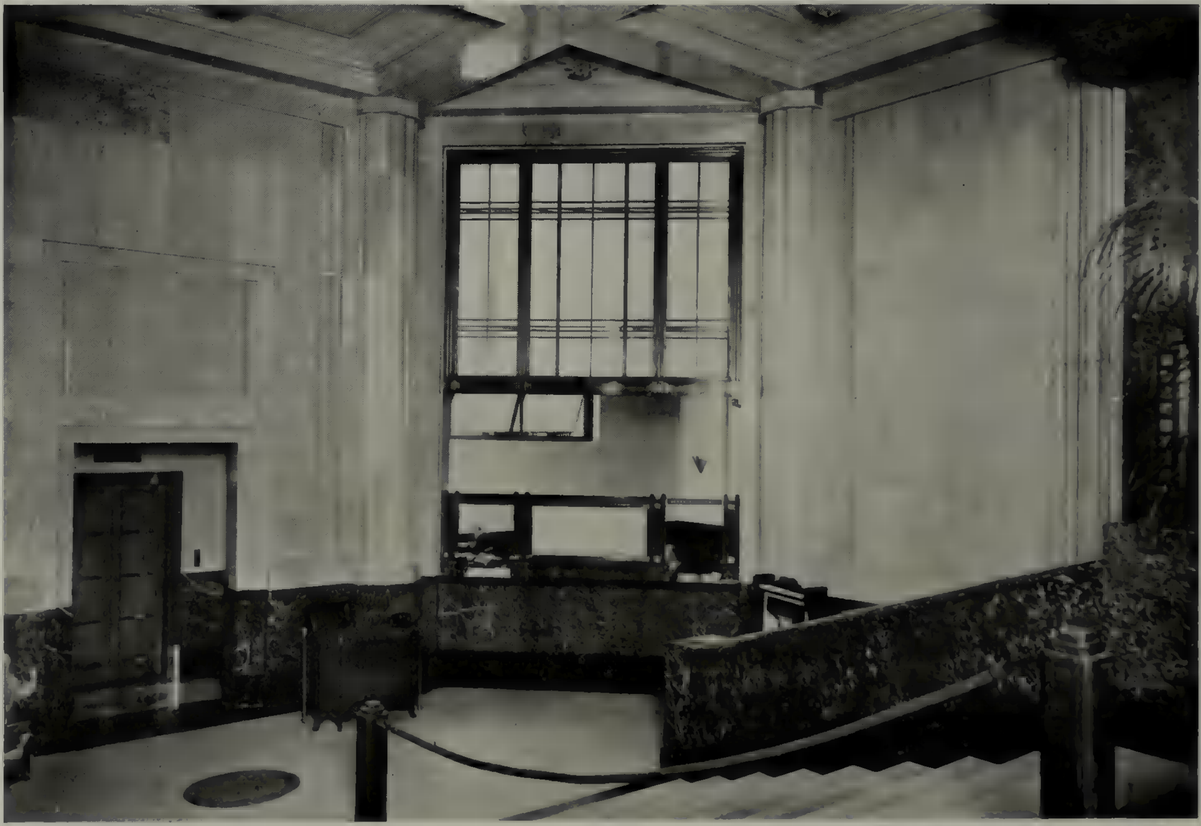
Fischer

NEW YORK CITY BRANCH

NATIONAL CITY BANK OF NEW YORK
WALKER AND GILLETTE, ARCHITECTS

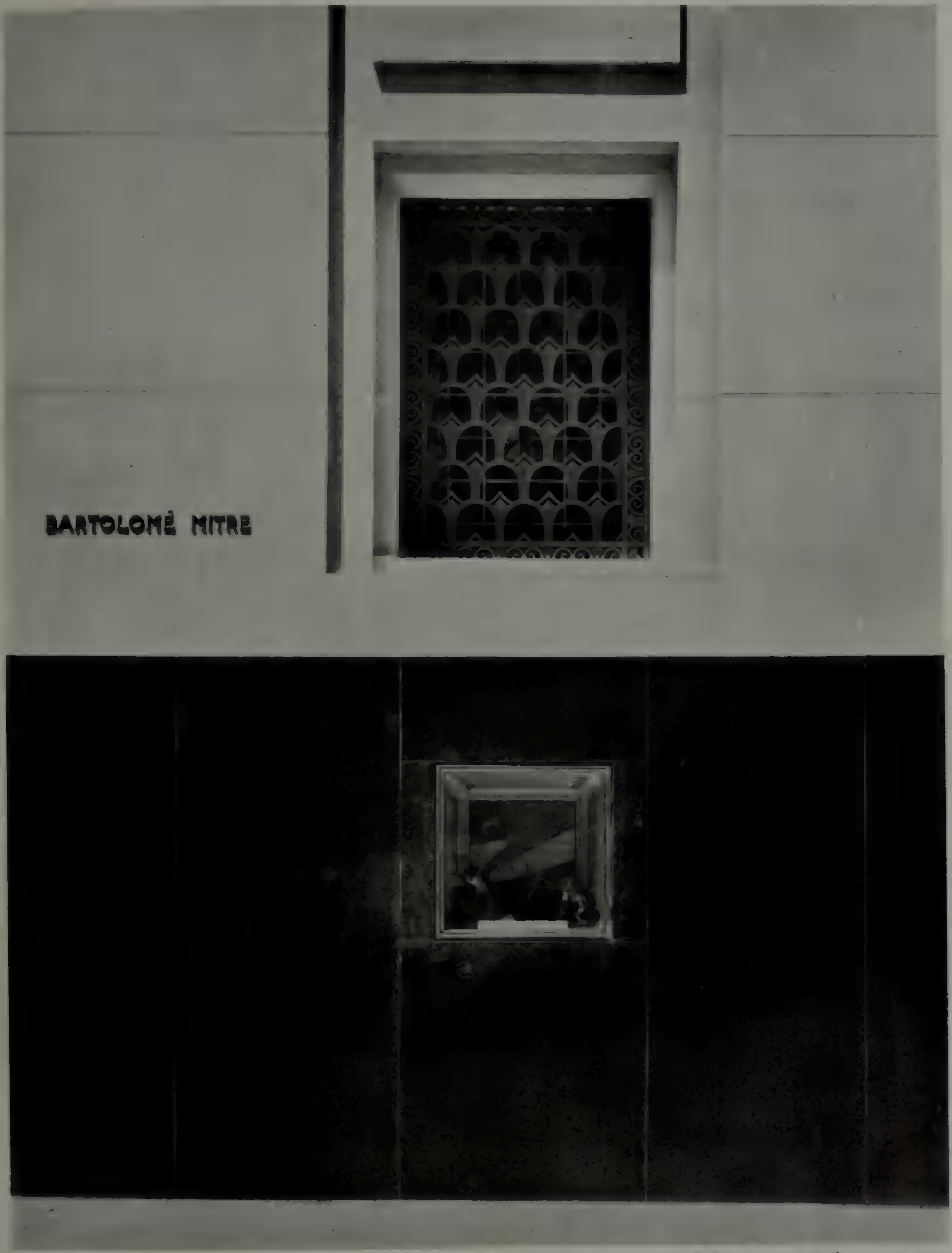


Main banking room



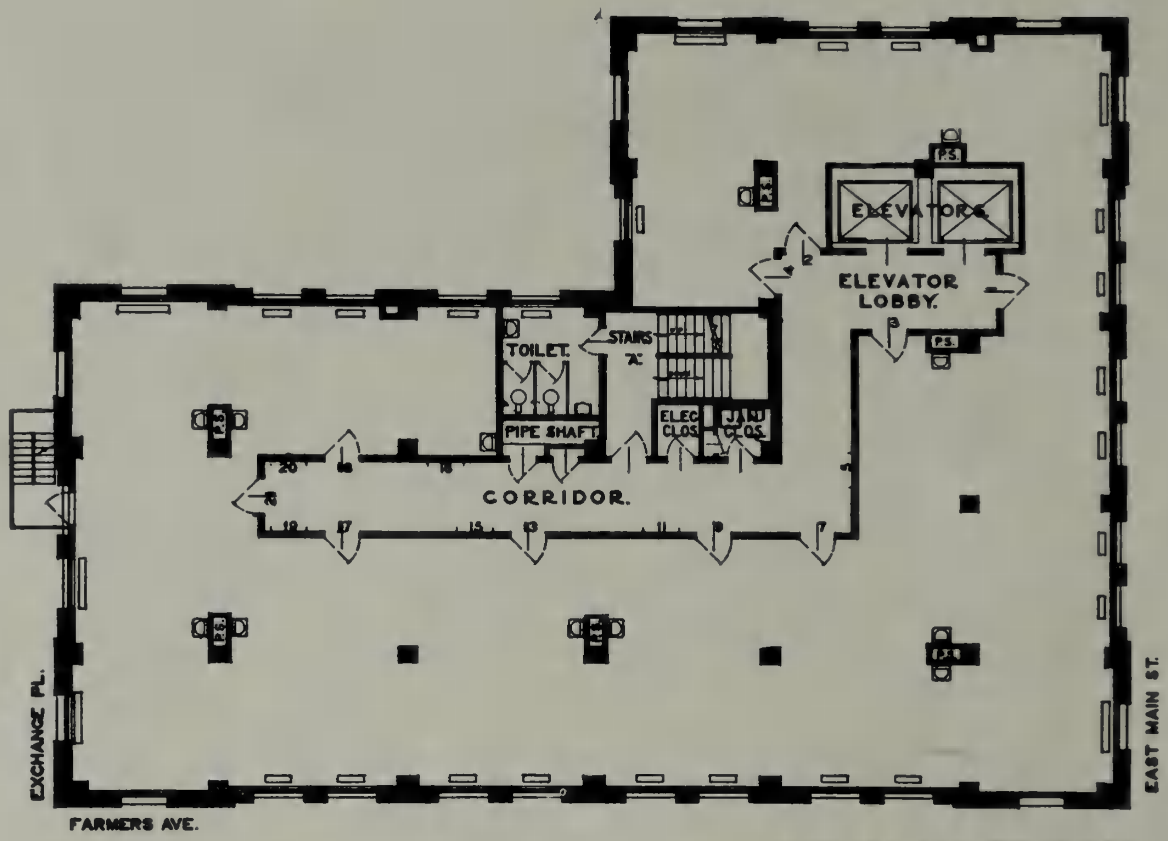
Foreign exchange window

NATIONAL CITY BANK OF NEW YORK
PANAMA BRANCH
WALKER AND GILLETTE, ARCHITECTS

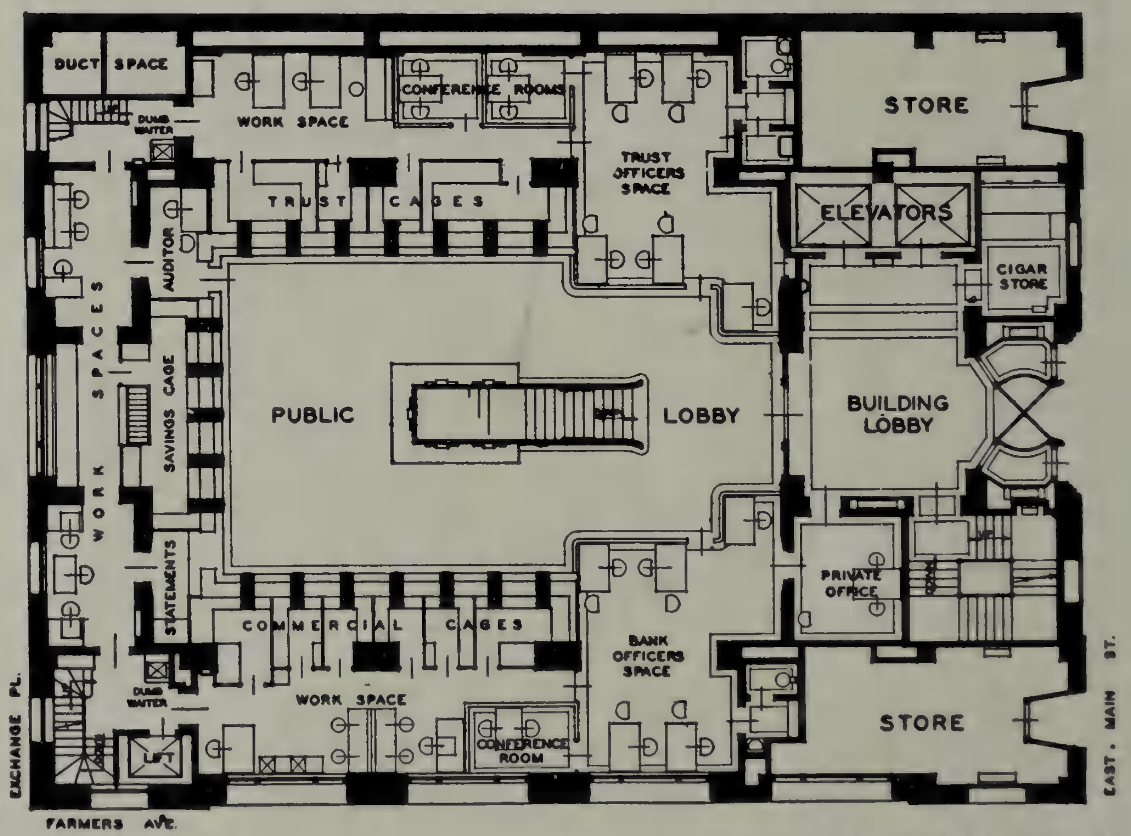


Advertising window on street

NATIONAL CITY BANK OF NEW YORK
PANAMA BRANCH
WALKER AND GILLETTE, ARCHITECTS

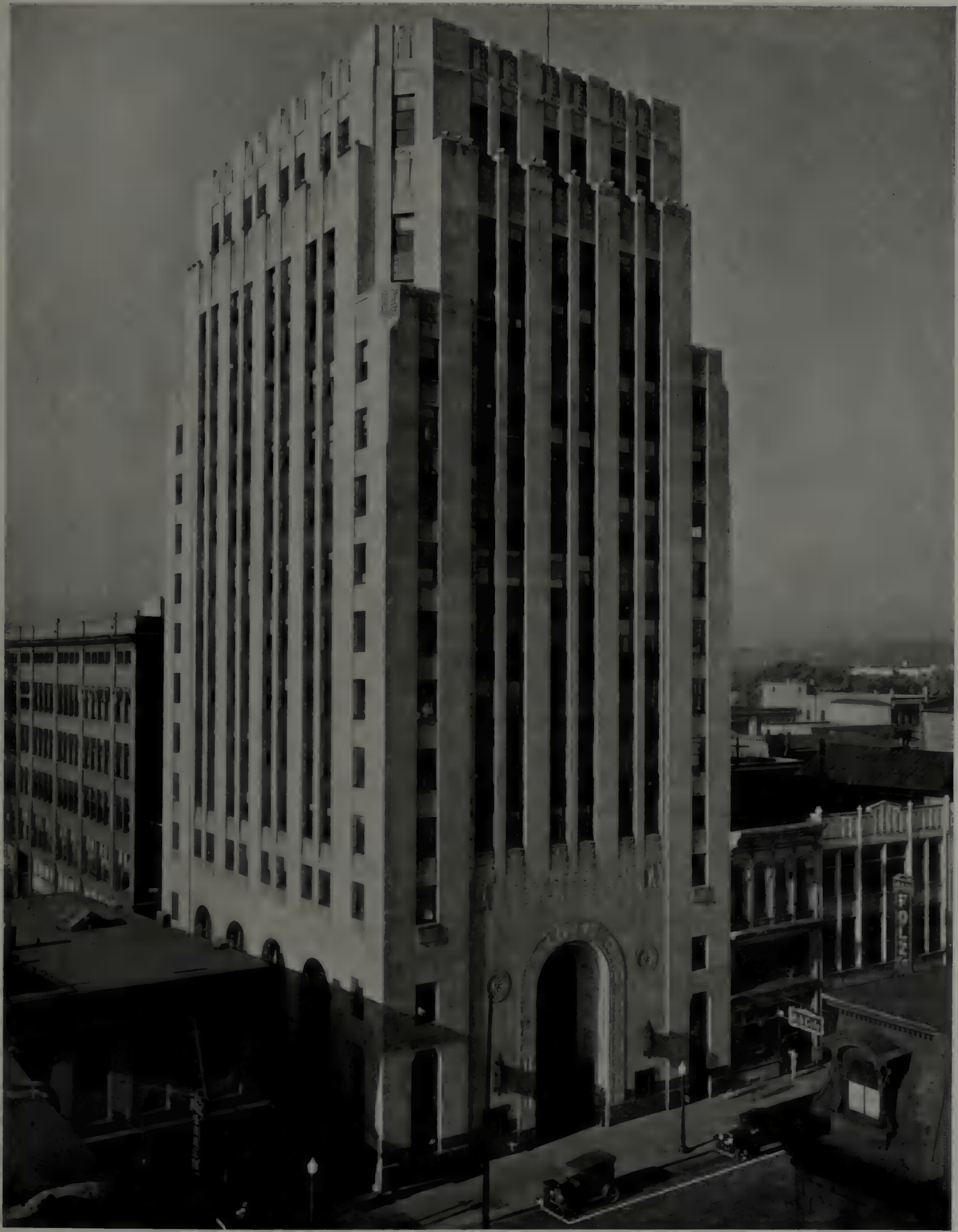


TYPICAL FLOOR PLAN

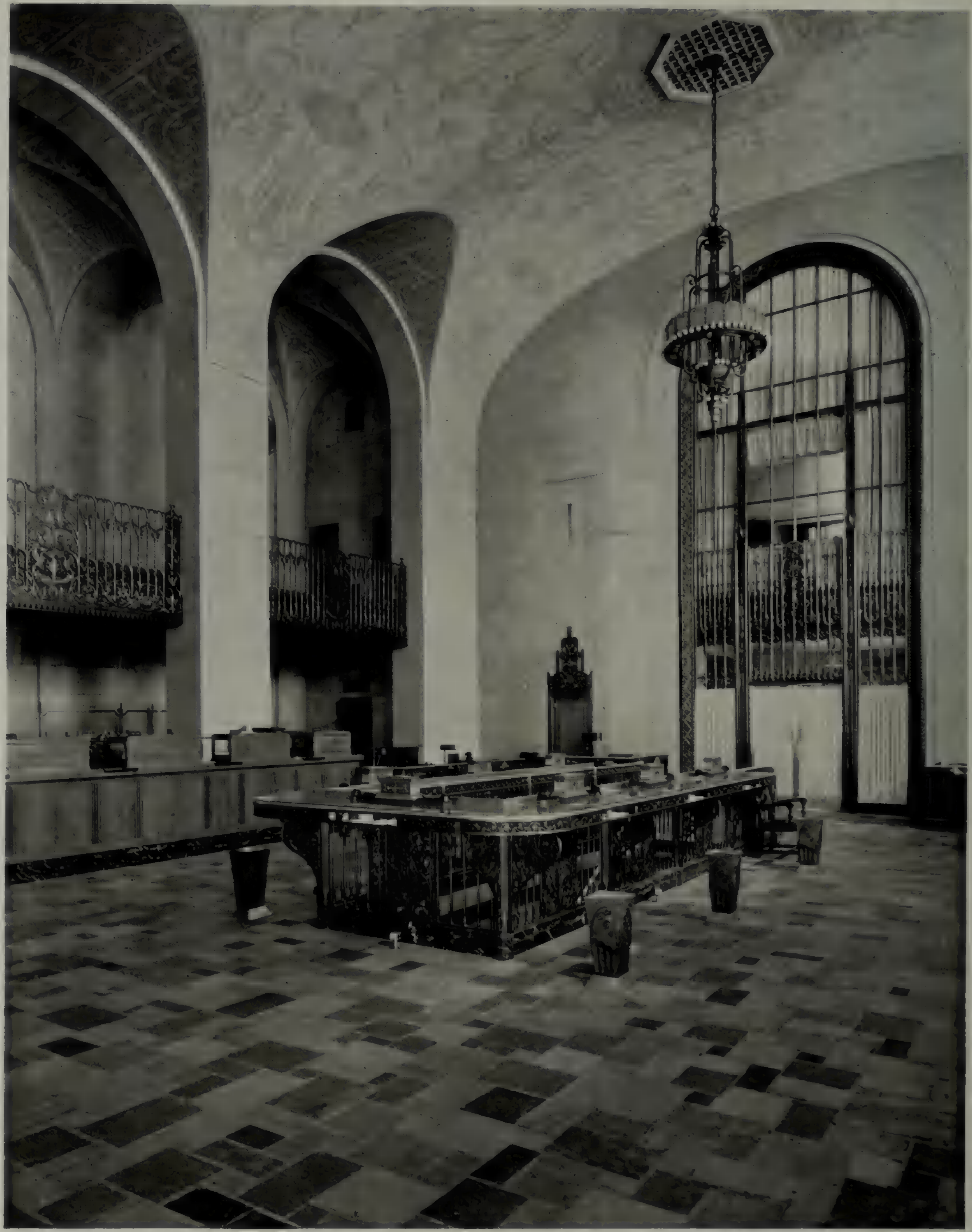


FIRST FLOOR PLAN

BANK OF KALAMAZOO
KALAMAZOO, MICH.
WEARY AND ALFORD, ARCHITECTS



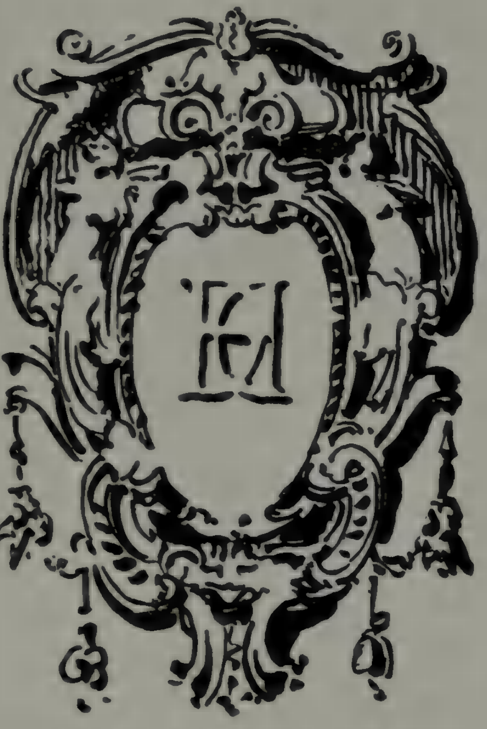
BANK OF KALAMAZOO
KALAMAZOO, MICH.
WEARY AND ALFORD, ARCHITECTS



BANK OF KALAMAZOO
KALAMAZOO, MICH.
WEARY AND ALFORD, ARCHITECTS

ARCHITECTS' INSIGNIA

By
VICTOR GIFFORD



DENNISON AND HIRONS

The plan titles of architects not only set the stamp of genuineness upon drawings, but they frequently disclose individuality of architect. Although titles in the form of cartouches are obviously an expensive flourish to the actual drawing, and necessitate additional drafting which otherwise might be spent to better advantage, nevertheless in many cases they embellish the drawing.

The title of Dennison and Hirons is of the classical order, having a cartouche flanked by two nude figures and surrounded by Louis XV scroll design. The initials comprise the center motif: two D's face each other with a horizontal bar running through the center, forming an H.

The plan label of McKim, Mead and White is of classical design, characteristic of the work of this firm of architects.

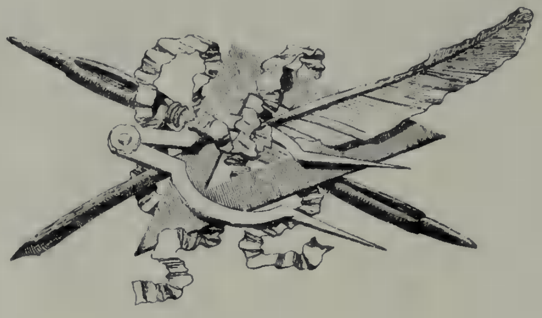
Architects do not confine themselves to one style of title design, as shown by the two examples by George B. Post and Sons.

The label of Leigh French, Jr., is very characteristic, the quill being symbolic of his ability as an author on architectural subjects and the dividers, pencil and triangle, all interwoven by a ribbon, showing his profession as an architect.

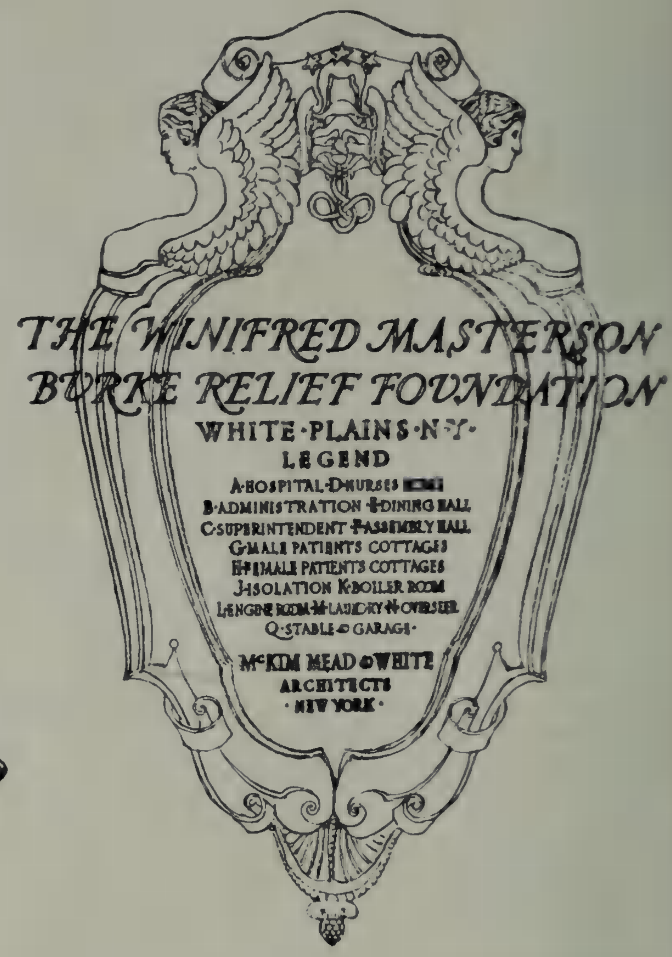
Cross and Cross, architects of the Barclay Hotel, designed a title for their exhibition drawing which the hotel later used on the linen and silver. The designer of the thistle emblem and scroll evidently had in mind the fact that the owner of the hotel was of Scotch ancestry.

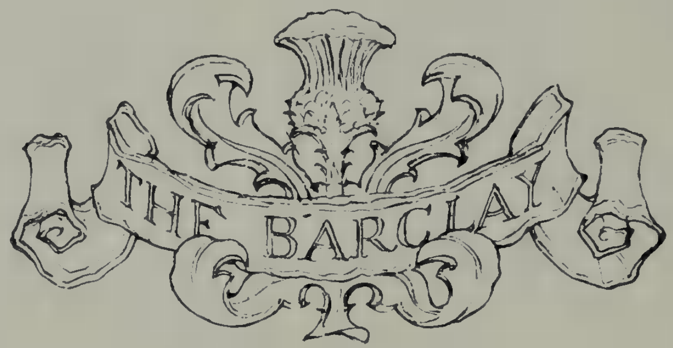
The cartouche and ribboned title by the firm of Goodwillie and Moran shows a design with a center motif appropriate to the drawing it was to adorn, the R being the surname initial of the owner.

An interesting label, denoting the architectural profession, is that of the firm of Delano and Aldrich. A protractor very appropriately designates the letter D, and a pair of dividers an A.

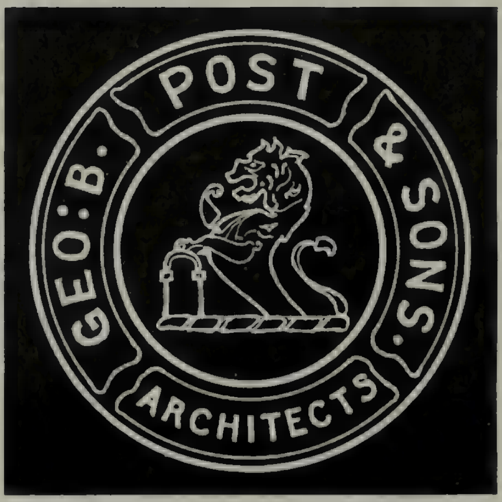


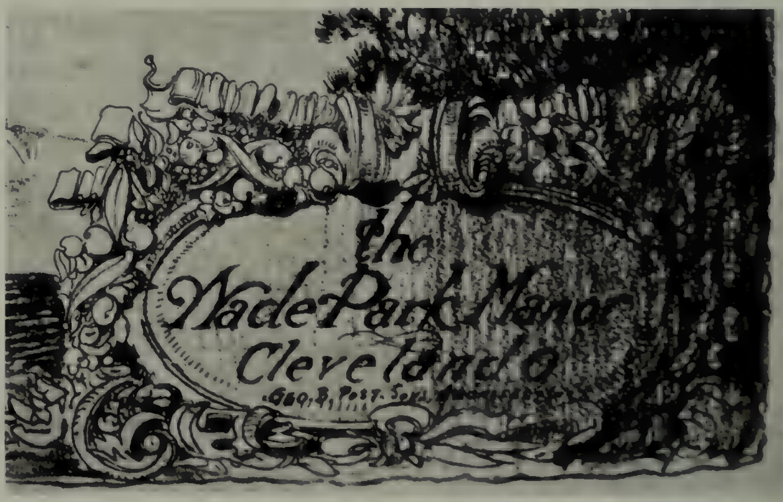
LEIGH FRENCH JR


THE WINIFRED MASTERSON
BURKE RELIEF FOUNDATION
WHITE·PLAINS·N·Y·
LEGEND
A·HOSPITAL·D·NURSES [illegible]
B·ADMINISTRATION·E·DINING HALL
C·SUPERINTENDENT·F·ASSEMBLY HALL
G·MALE PATIENTS COTTAGES
H·FEMALE PATIENTS COTTAGES
J·ISOLATION K·BOILER ROOM
L·ENGINE ROOM·M·LAUNDRY·N·OVERSEER
Q·STABLE & GARAGE·
McKIM MEAD & WHITE
ARCHITECTS
·NEW YORK·

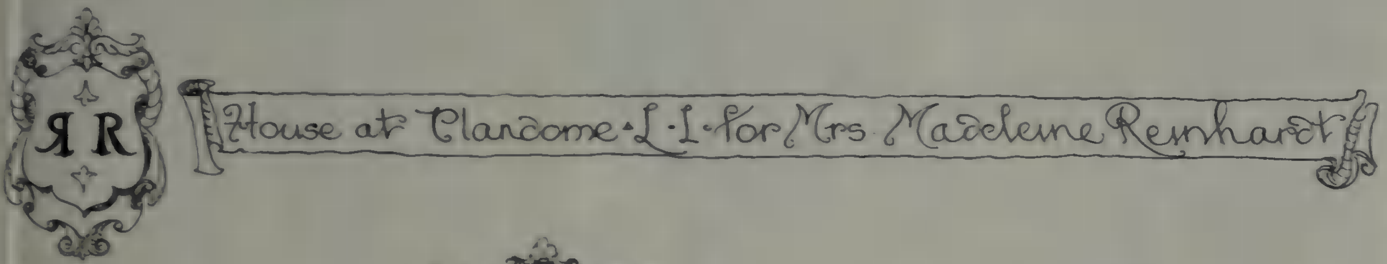


CROSS AND CROSS
ARCHITECTS



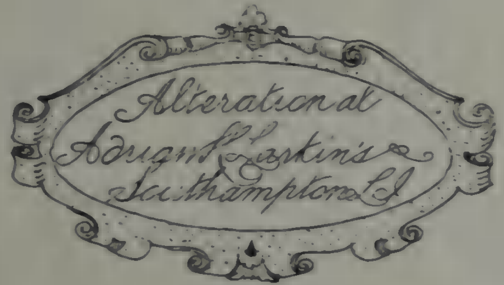


ARCHITECTS' INSIGNIA



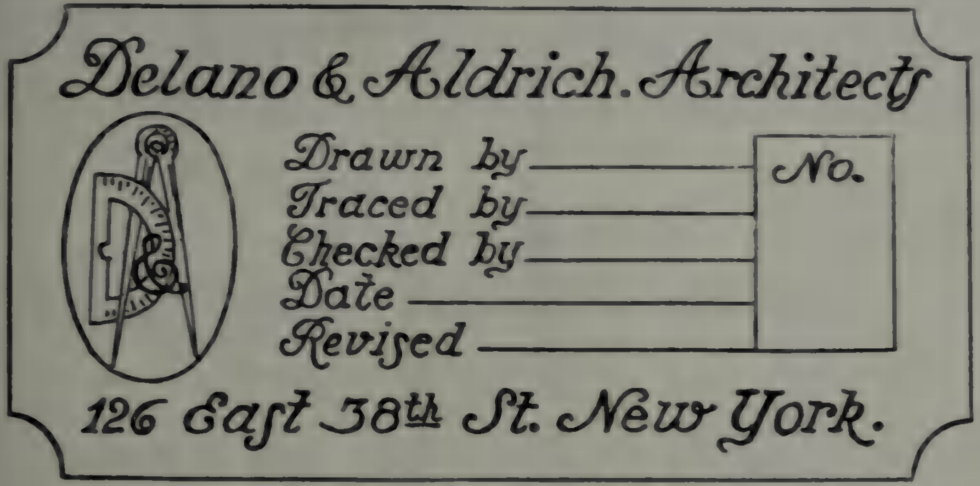
RR

House at Clandome L.I. for Mrs Madeleine Reinhardt



Alteration at
Adrian Larkin's
Southampton L.I.

GOODWILLIE AND MORAN
ARCHITECTS



Delano & Aldrich. Architects

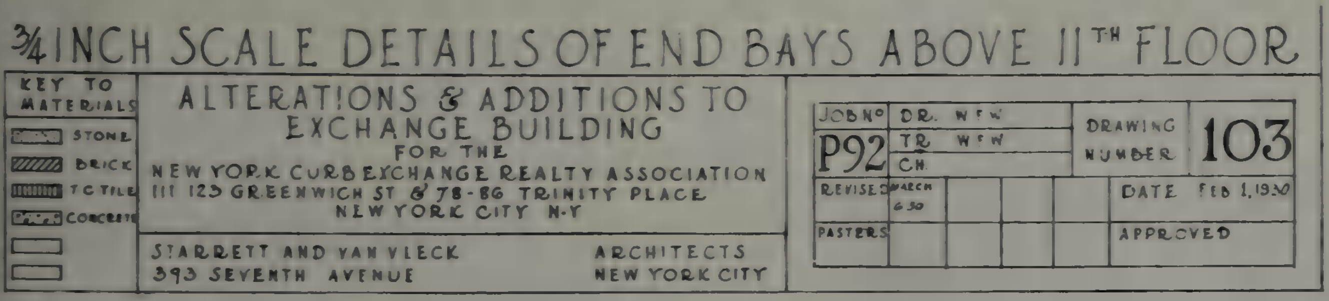
Drawn by ____
Traced by ____
Checked by ____
Date ____
Revised ____

No.

126 East 38th St. New York.

Design for a stamp which saves time in drafting.

The present tendency is toward simplification in drafting. The cartouche type, although artistically presented, requires too much painstaking work and time, and is not as informative as the average working drawing label.



3/4 INCH SCALE DETAILS OF END BAYS ABOVE 11TH FLOOR

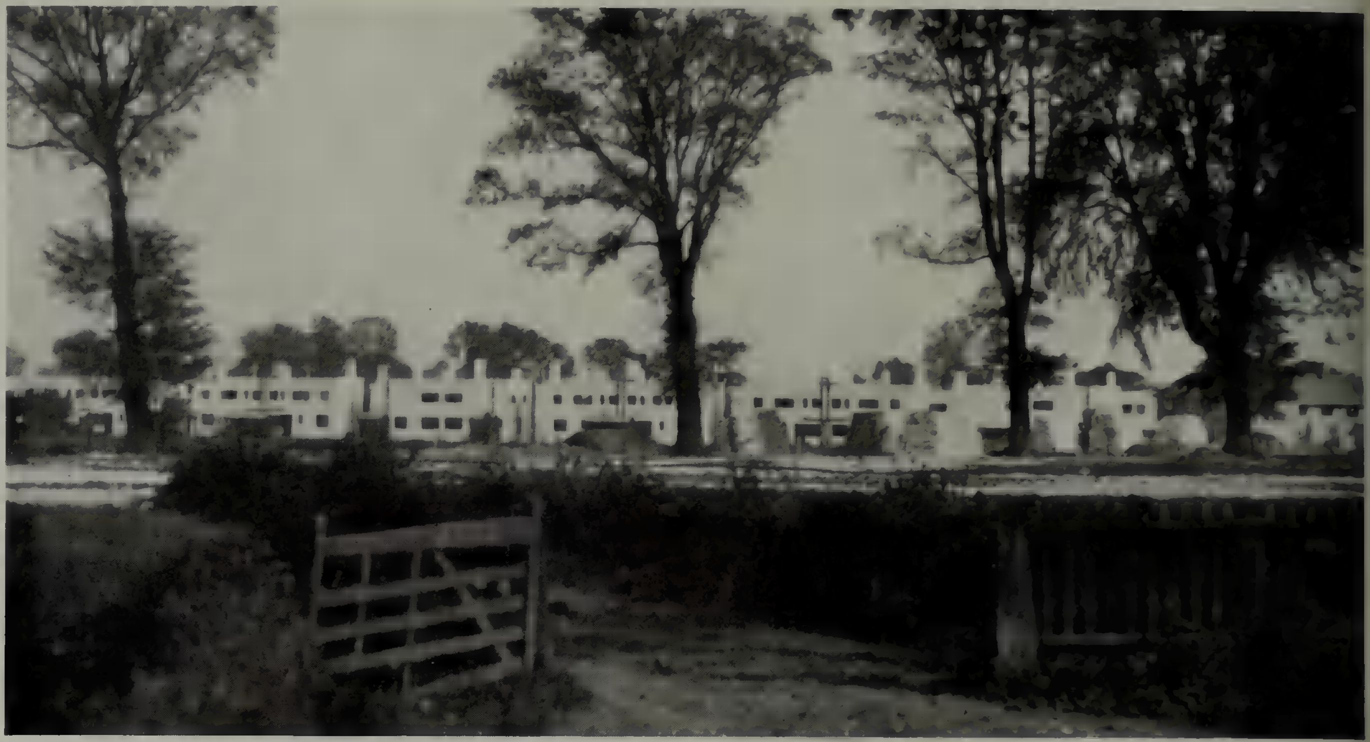
KEY TO MATERIALS
STONE
BRICK
TC TILE
CONCRETE

ALTERATIONS & ADDITIONS TO
EXCHANGE BUILDING
FOR THE
NEW YORK CURB EXCHANGE REALTY ASSOCIATION
111 123 GREENWICH ST & 78-86 TRINITY PLACE
NEW YORK CITY N-Y

STARRETT AND VAN VLECK ARCHITECTS
393 SEVENTH AVENUE NEW YORK CITY

JOB NO P92
DR. WFW
TR WFW
CH.
DRAWING NUMBER 103
REVISED MARCH 6 30
DATE FEB 1, 1930
PASTERS
APPROVED

ARCHITECTS' INSIGNIA



AN ENGLISH GARDEN VILLAGE

SILVER END, WITHAM, ESSEX

In 1926, as the result of the acute housing shortage, the Crittall Manufacturing Company, Limited, began building operations for a garden village midway where employees could live within easy distance of their work.

For this project buildings were designed by Sir John Burnet and Partners, James Miller, C. Murray Hennell, C. H. D. Quennell, Joseph Clare and G. E. Clare, architects.

•

FIVE HOUSE TYPES AND COSTS

The village comprises 400 completed houses, all with large gardens and built no closer than ten to the acre. These houses can be broadly classified into five types:

Managers' houses, sold at prices ranging from $6,500 to $8,550;

Detached four-bedroom houses, $3,800;

Detached parlor houses, $3,400;

Parlor houses (containing parlor, kitchen, scullery, three bedrooms, and bath), from $2,100 to $2,600;

Non-parlor houses (containing three bedrooms), from $1,650 to $1,950.

The majority of these houses have been sold to the tenants on a 20-year purchase system, the weekly purchase rental being approximately $4 for the non-parlor type and $4.50 for the parlor type. This price includes water and ground rent.

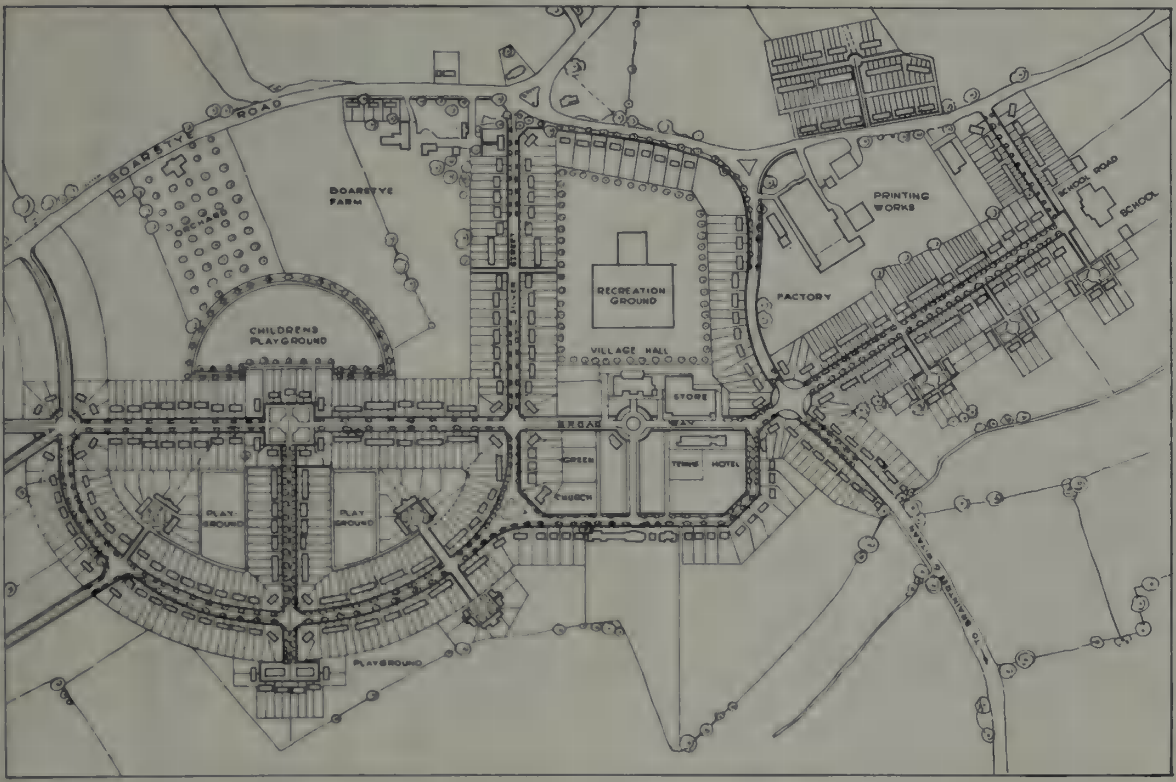
•

VILLAGE FEATURES

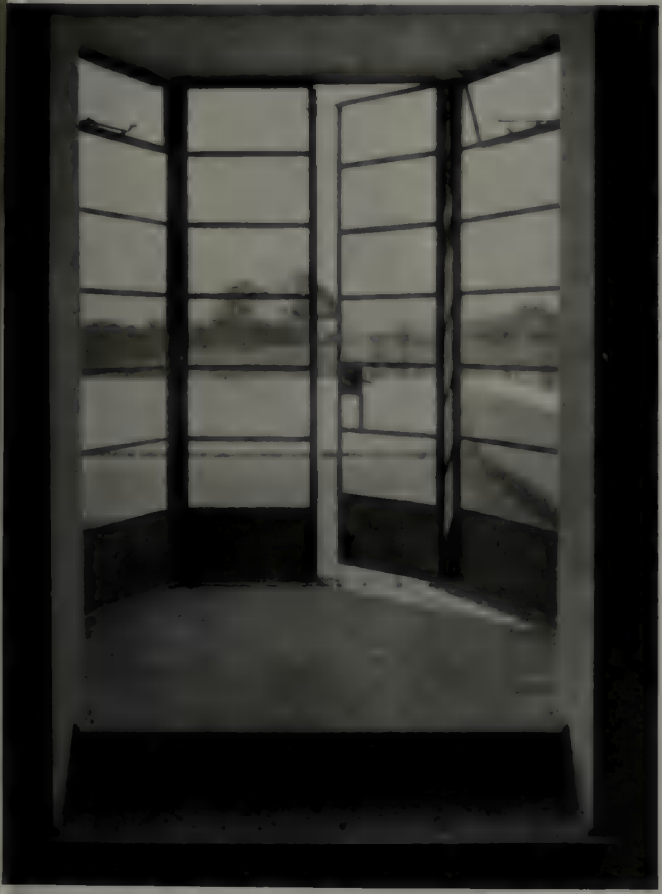
Since the beginning of the project additional surrounding lands have been purchased, forming an agricultural belt of approximately 700 acres where food is produced for the village.

In the center of the village is a large department store where the products of the village are sold to the inhabitants. This store serves for butchery, bakery, drapery, grocery provisions, furniture, drugs, outfitting, et cetera. There is also a fully licensed hotel with 16 bedrooms.

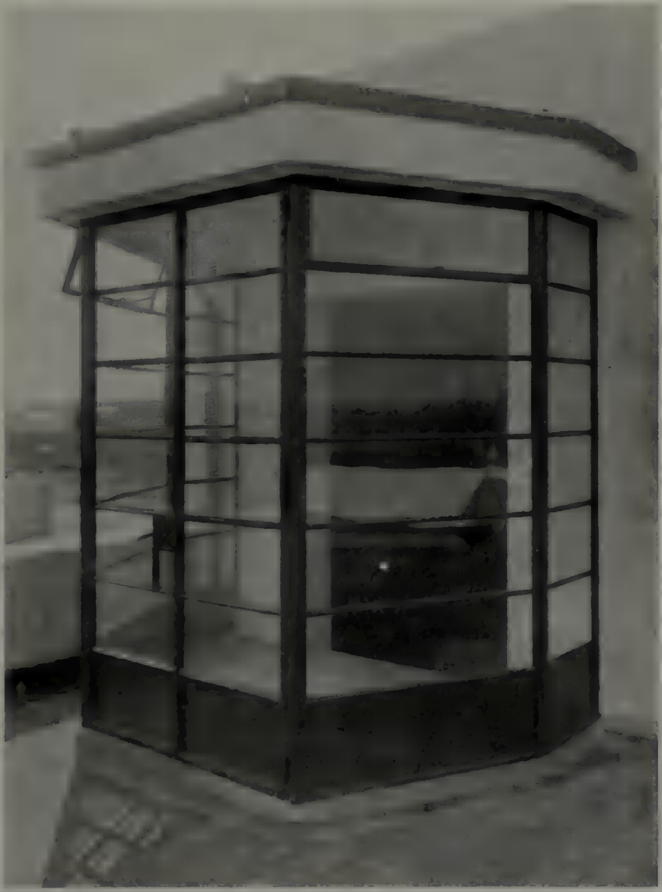
The village water supply is pumped in from a spring two miles away. A power station using oil engines supplies the village and factories with power and light



PLOT PLAN
OF VILLAGE

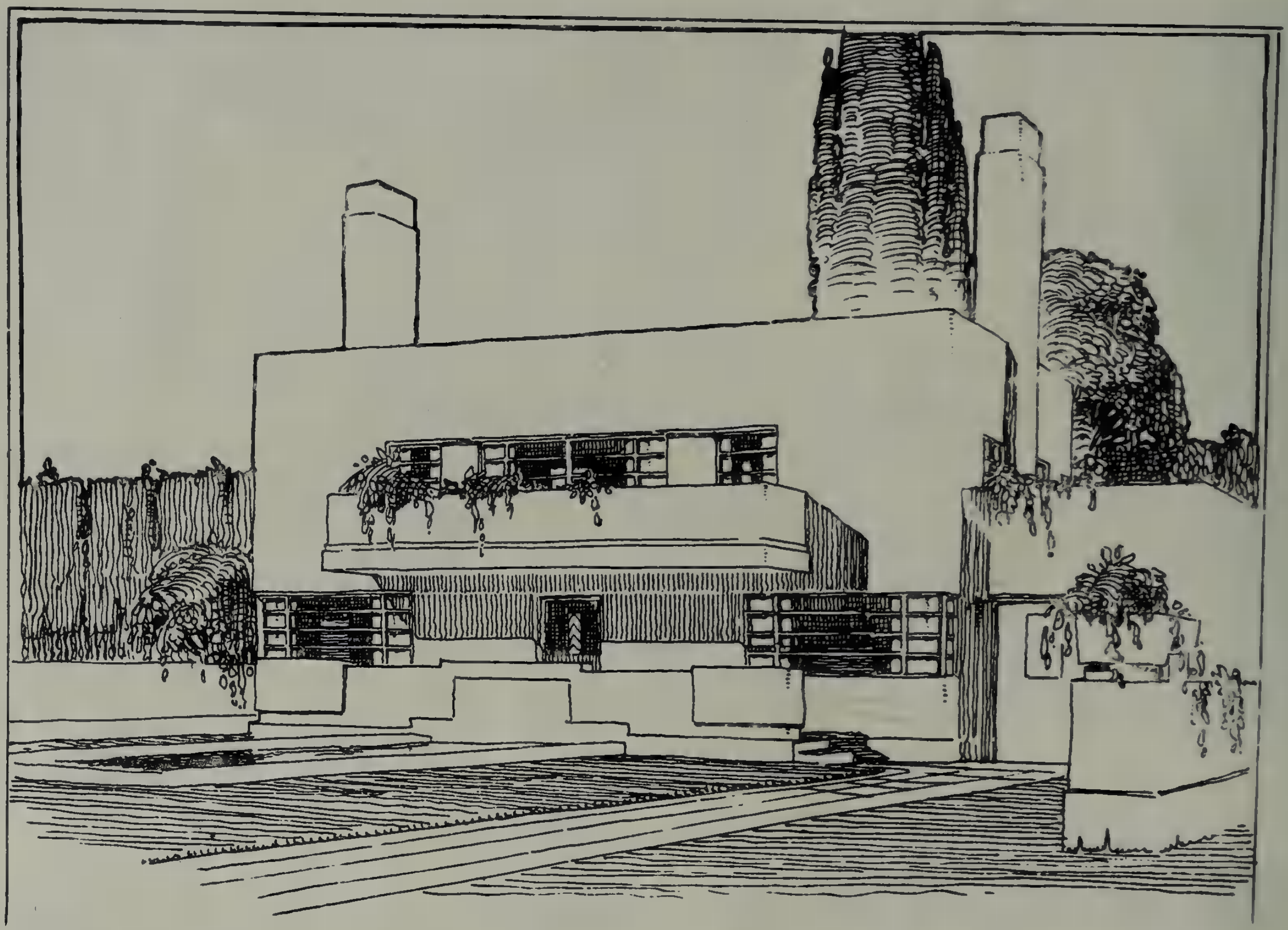


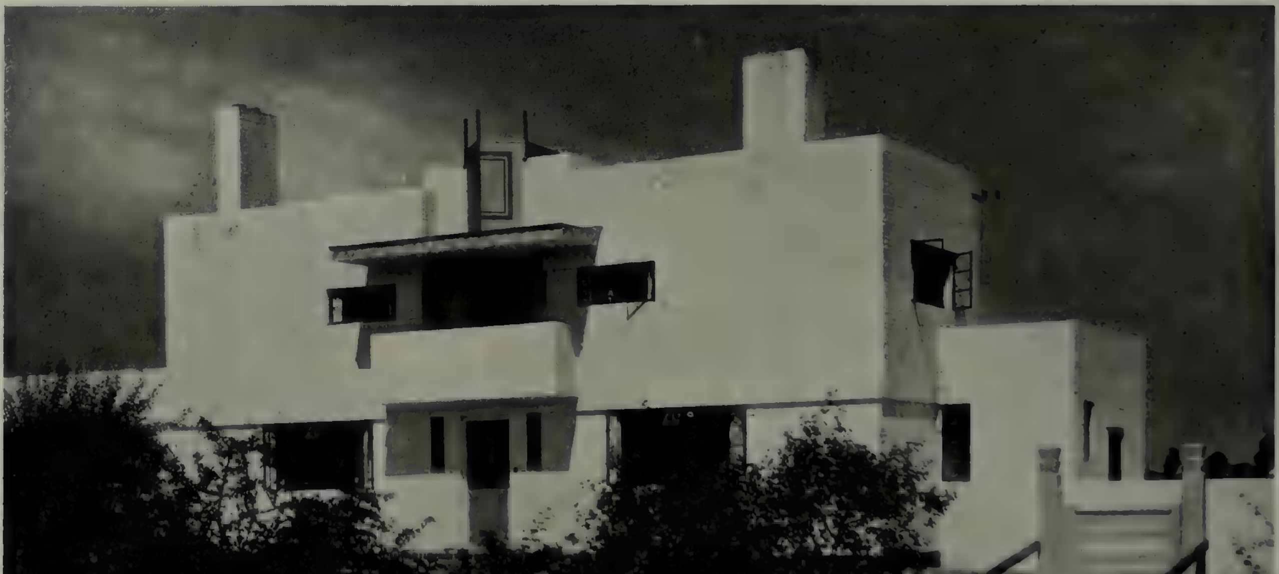
Interior of Bay



Exterior of Bay

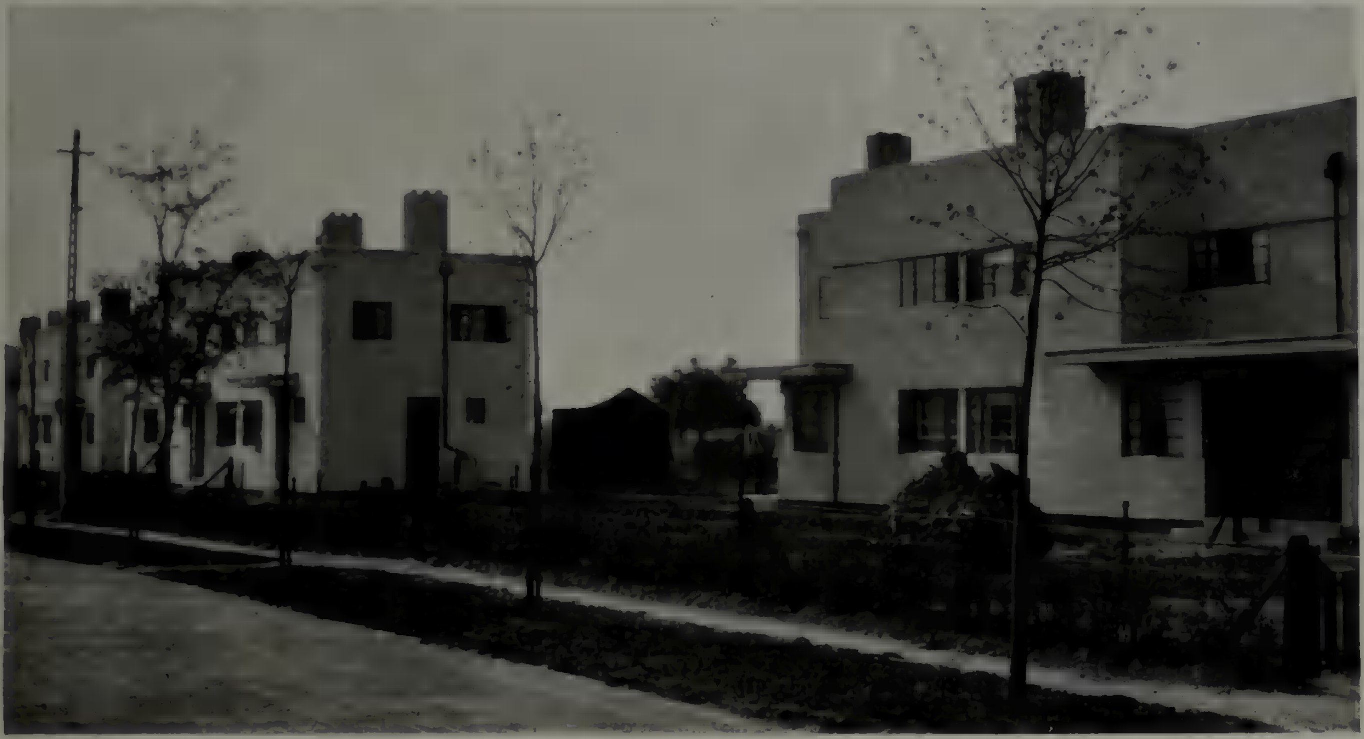
SILVER END GARDEN VILLAGE
ESSEX, ENGLAND
JOHN BURNET AND PARTNERS, ARCHITECTS



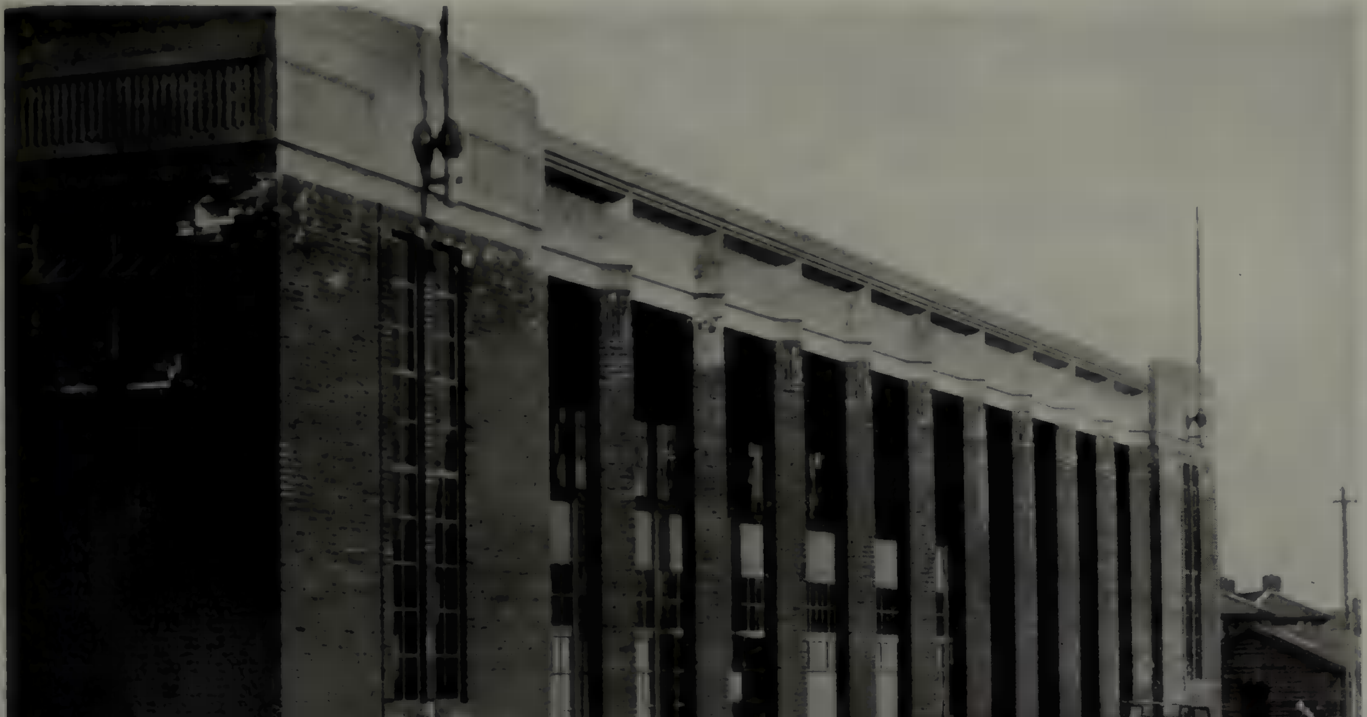


Newbery

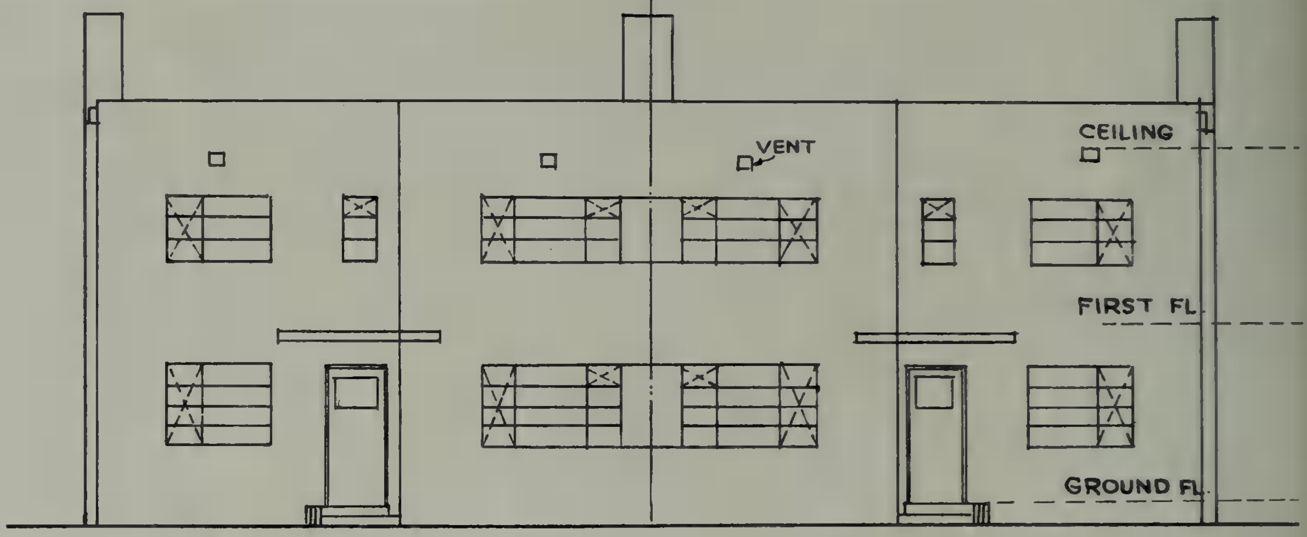
HOUSES AT SILVER END GARDEN VILLAGE
ESSEX, ENGLAND
THOMAS S. TAIT OF JOHN BURNET AND PARTNERS, ARCHITECTS



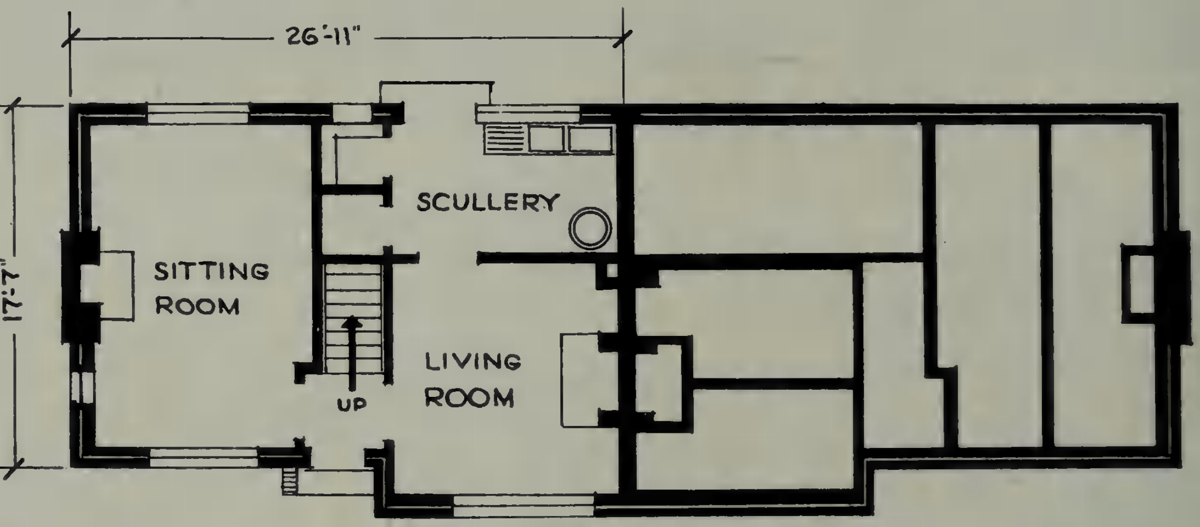
HOUSES ON SILVER STREET



GENERAL STORES AT SILVER END GARDEN VILLAGE
ESSEX, ENGLAND
JOHN BURNET AND PARTNERS, ARCHITECTS

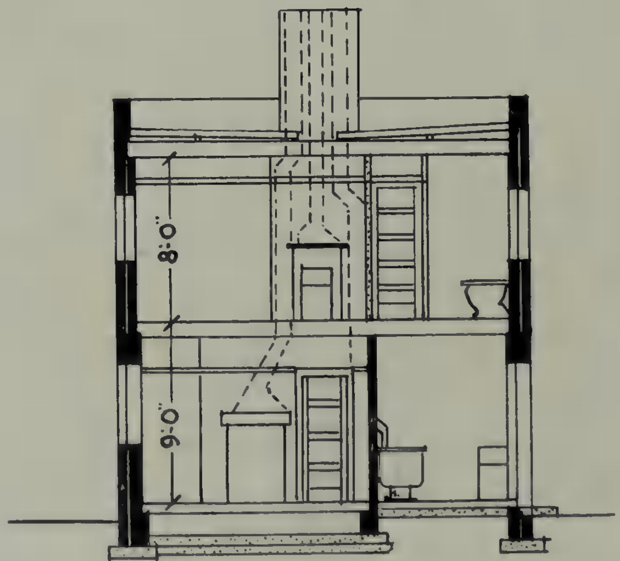


FRONT ELEVATION



GROUND FLOOR

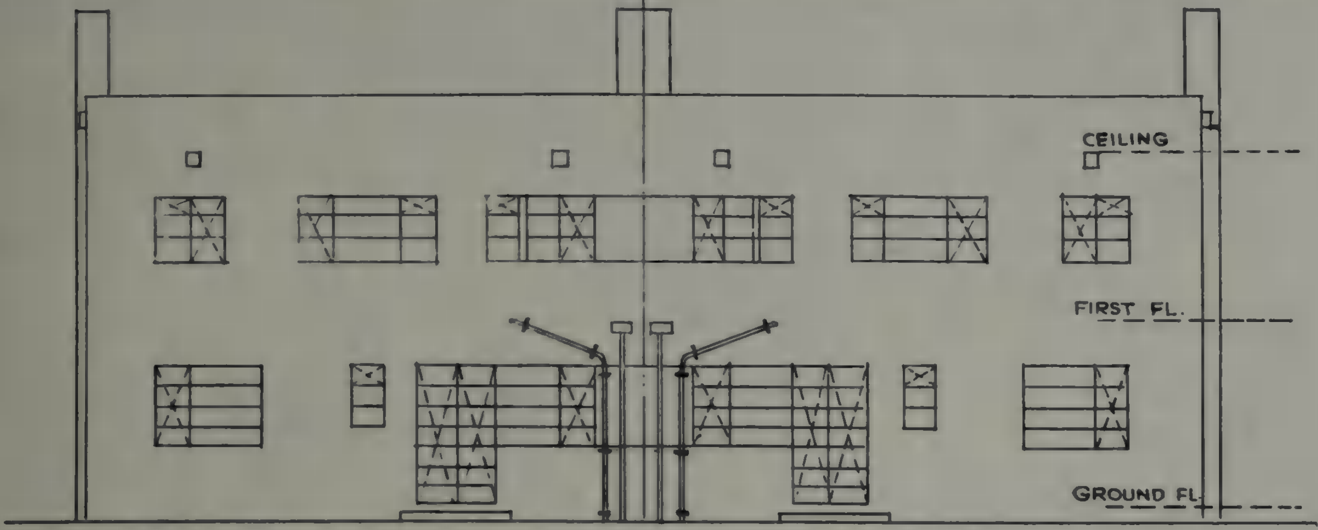
FOUNDATION



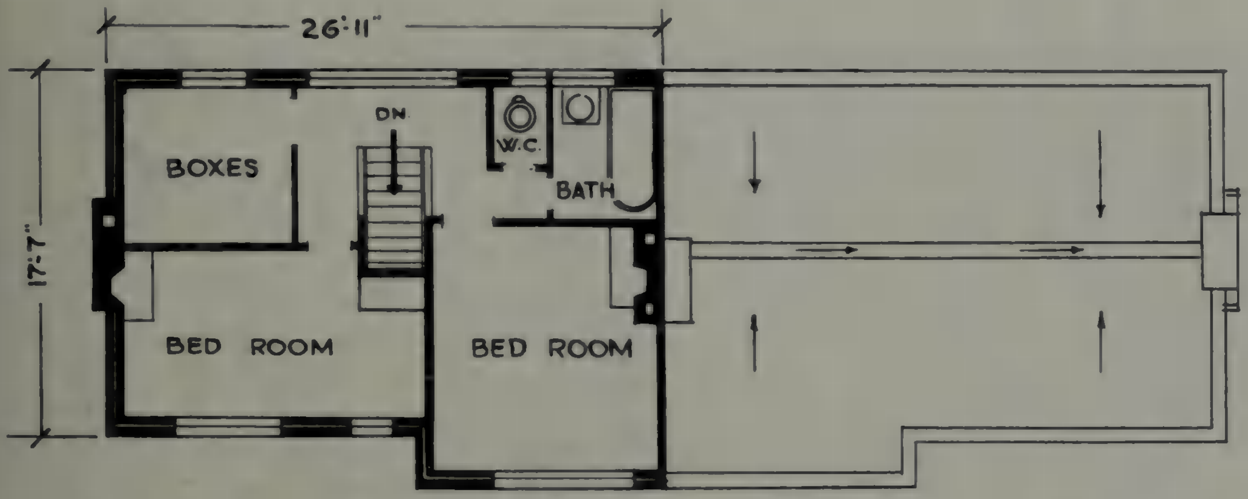
SECTION

SILVER END GARDEN VILLAGE
ESSEX, ENGLAND

JOHN BURNET AND PARTNERS
ARCHITECTS



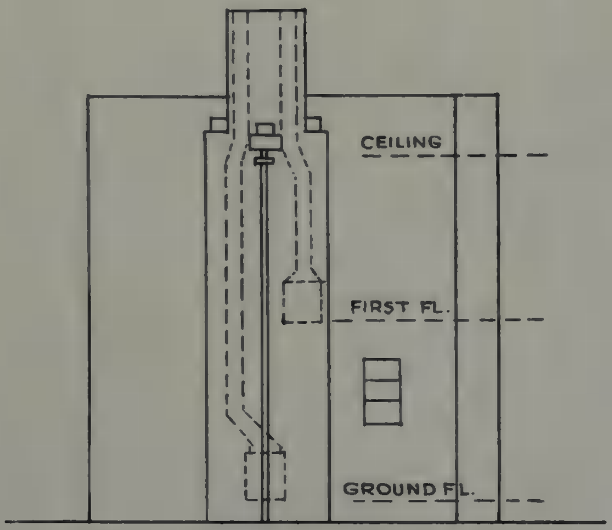
BACK ELEVATION



FIRST FLOOR

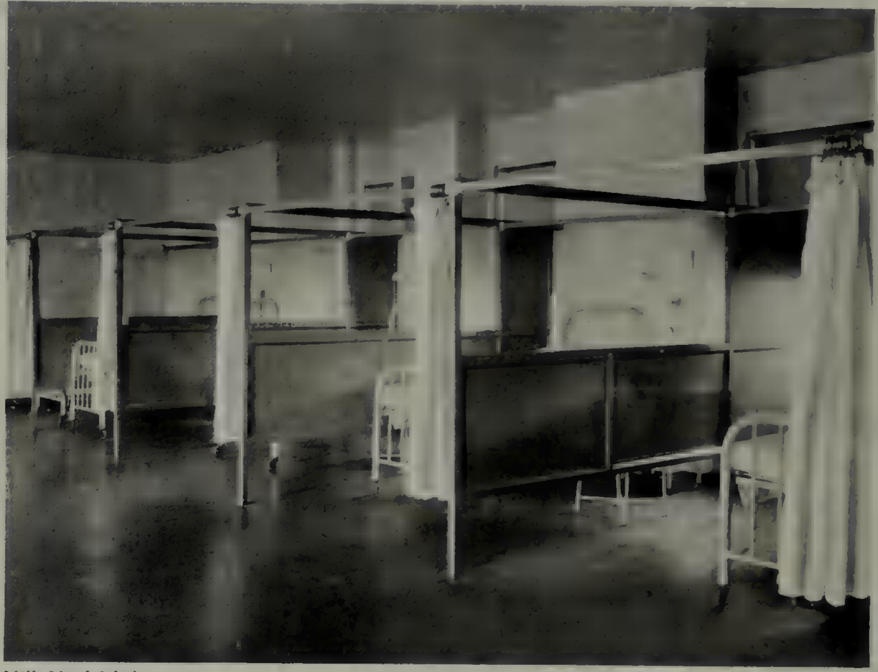
ROOF

PARLOR HOUSE TYPE
SILVER STREET



END ELEVATION

Each cubicle is amply provided with light from an individual window.



Mills Metal Cubicles

CUBICLES IN HOSPITALS

CORNELIUS S. LODER

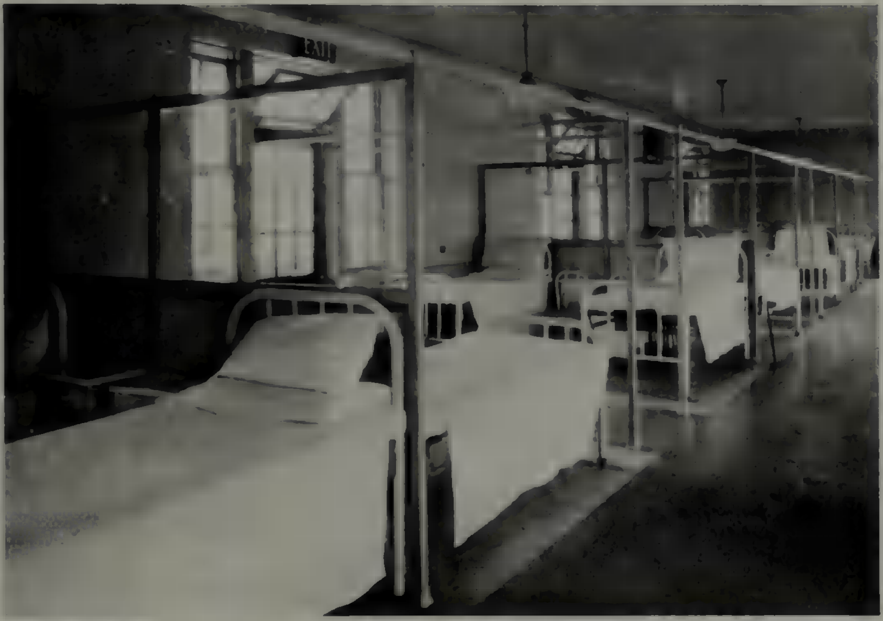
Cubicles are now in use in 80 per cent of our hospitals. Their installation can be accomplished without extensive cost.

When installed in old buildings they only slightly increase weight; they are fireproof and may reduce the fire insurance premium. On the other hand, in the planning of a ward for patients' beds, additional space would be required if cubicles were used. Thus, if a large open adult ward were to be constructed for cubicles, the floor area per cubicle bed would be increased from about 75 sq. ft. to about 105 sq. ft., and the number of beds would be reduced from about 45 to 35. This would increase the cost from about $500 to $650 a bed. The estimated cost, including installation, for eight cubicles is about $750 or about $95 a cubicle. However, the advantages offered by cubicle service are unique and in many cases indispensable.

The best type of cubicle has walls 7 ft. in height; the walls rest on legs of steel firmly fastened to the cement or other hard material floor. The space between the cubicle wall and the floor should be 12″ to 18″, preferably 16″, to allow for the convenient cleaning of the floor. The fourth side of the cubicle is usually open, and when privacy is desired, a curtain hanging on a rod can be drawn across the opening. The cubicle walls have been extended to the ceiling only in exceptional cases in order to keep out odor or noise. This additional height increases the cost.

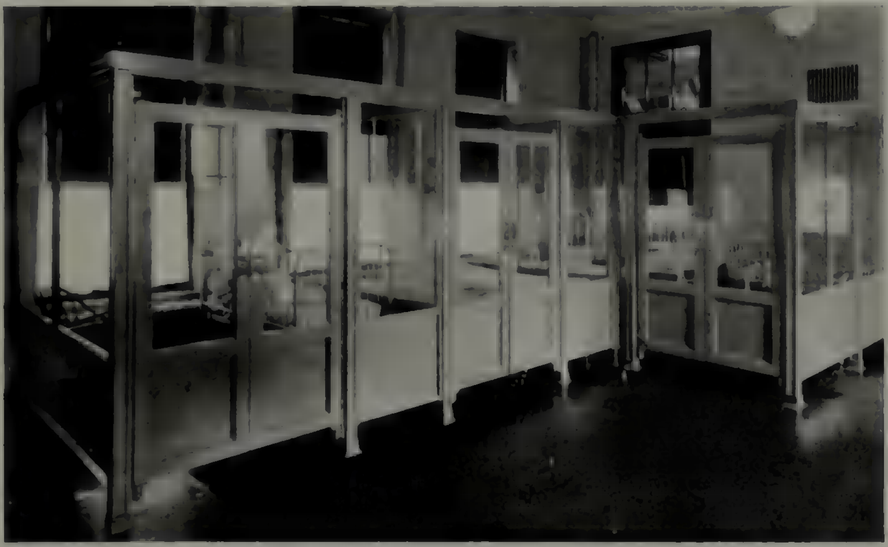
Cubicle walls are generally made of metal and the upper part, from the level of the patient's head, of glass. The wall length of an adult's cubicle is from 7 ft. to 12 ft., depending on the corridor space available. The width of the cubicle is 7 ft. to 10 ft. The size of a child's cubicle is 6 ft. by 5 ft. The glass panes in the upper part of the wall in a child's cubicle can be made smaller or possibly thicker in order to lessen the risk of breakage. In children's wards the use of wired glass is very appropriate.

Ventilation, heating and lighting of cubicles is important. Cubicles located in the center of a ward are not so well ventilated as those placed along the sides and opening into the center of the room. Each cubicle should have its own window; in the reconstruction of wards in old hospitals this is sometimes rather difficult to arrange. It is very seldom that patients in two different cubicles sharing one window agree upon the ventilation. A modern cubicle should also have its own radiator, if possible, and hot and cold running water. A cubicle can be furnished like a private room. Bright



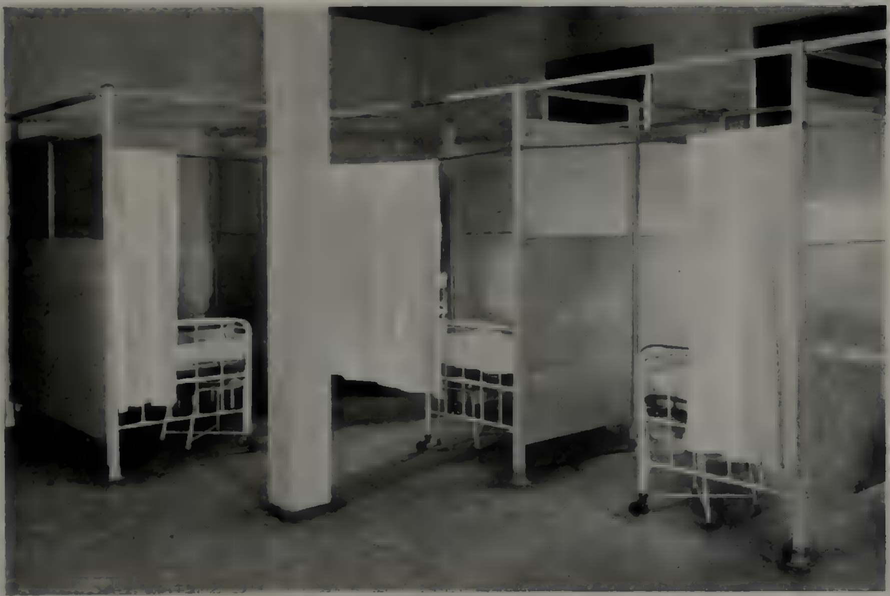
Four-bed cubicles in a large ward. Considerable privacy and isolation is secured without any loss of light.

Mills Metal Cubicles



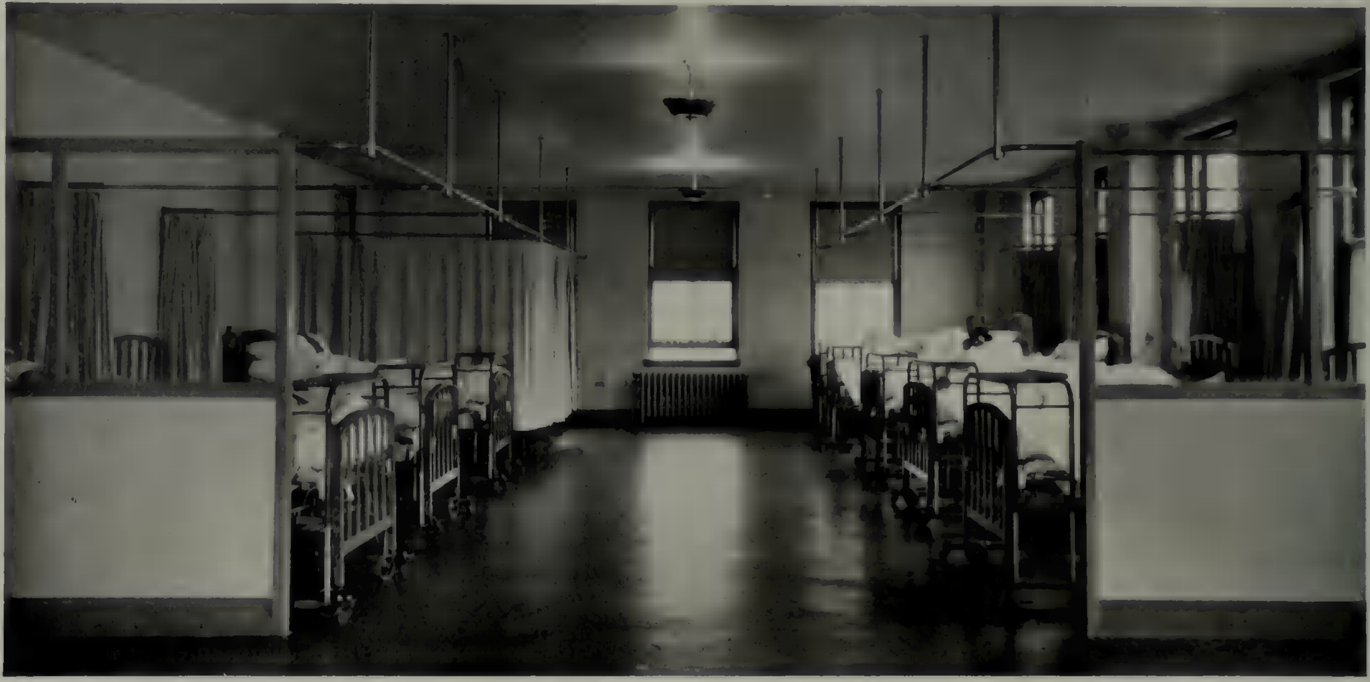
These cubicles in the children's ward of a hospital in Boston have glass doors so that visitors need not enter the cubicles but can observe the patients from outside.

Weis Mfg. Co., Elkhart, Ind.

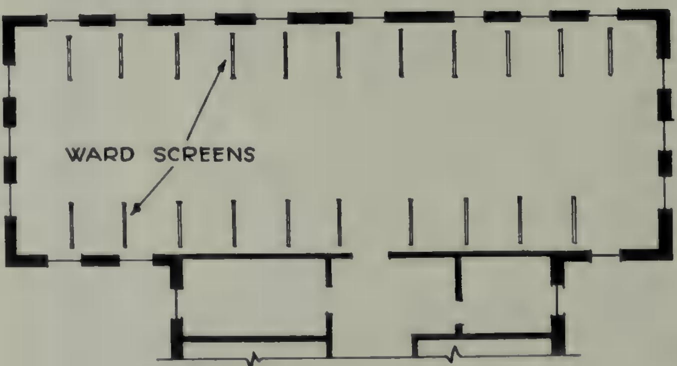


Hospital in Braddock, Pa. Cubicles have opaque glass in upper part of walls. Curtains hang on heavy wire.

Sanymetal Products Co.



N. L. Judd Co.



FRENCH HOSPITAL, NEW YORK
CROW, LEWIS AND WICK, ARCHITECTS

and cheerful colors can be chosen for floor-covering, walls and furniture.

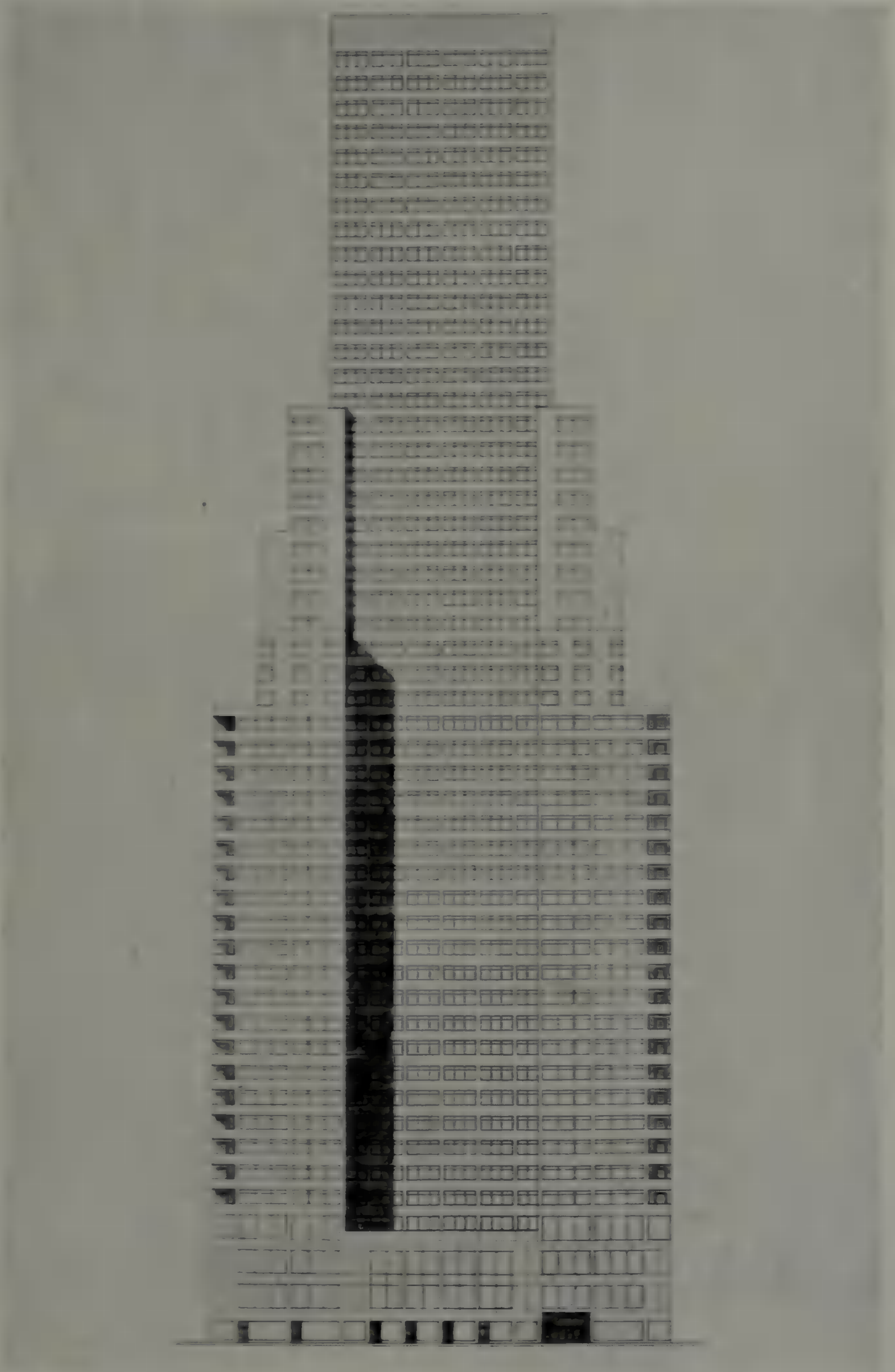
For the upper part of the cubicle walls either ordinary glass or ultra-violet ray glass permitting the transmission indoors of the invisible and beneficial rays of the sun can be used, especially in obstetrical rooms where complete privacy is desired. On the flat hospital roof cubicles can be built entirely of ultra-violet glass; they can also be installed on piazzas and piazza roofs or on the grounds.

The cubicle offers sociability. A small glass door can be arranged in the window pane in the upper part of the wall near the patient's head and opened at certain times, permitting the patients to converse with each other. When so desired these panes can be closed. This is a desirable arrangement in children's wards.

Another advantage of the cubicle system is in controlling cross-infection. This fact is of greatest importance in children's hospitals.

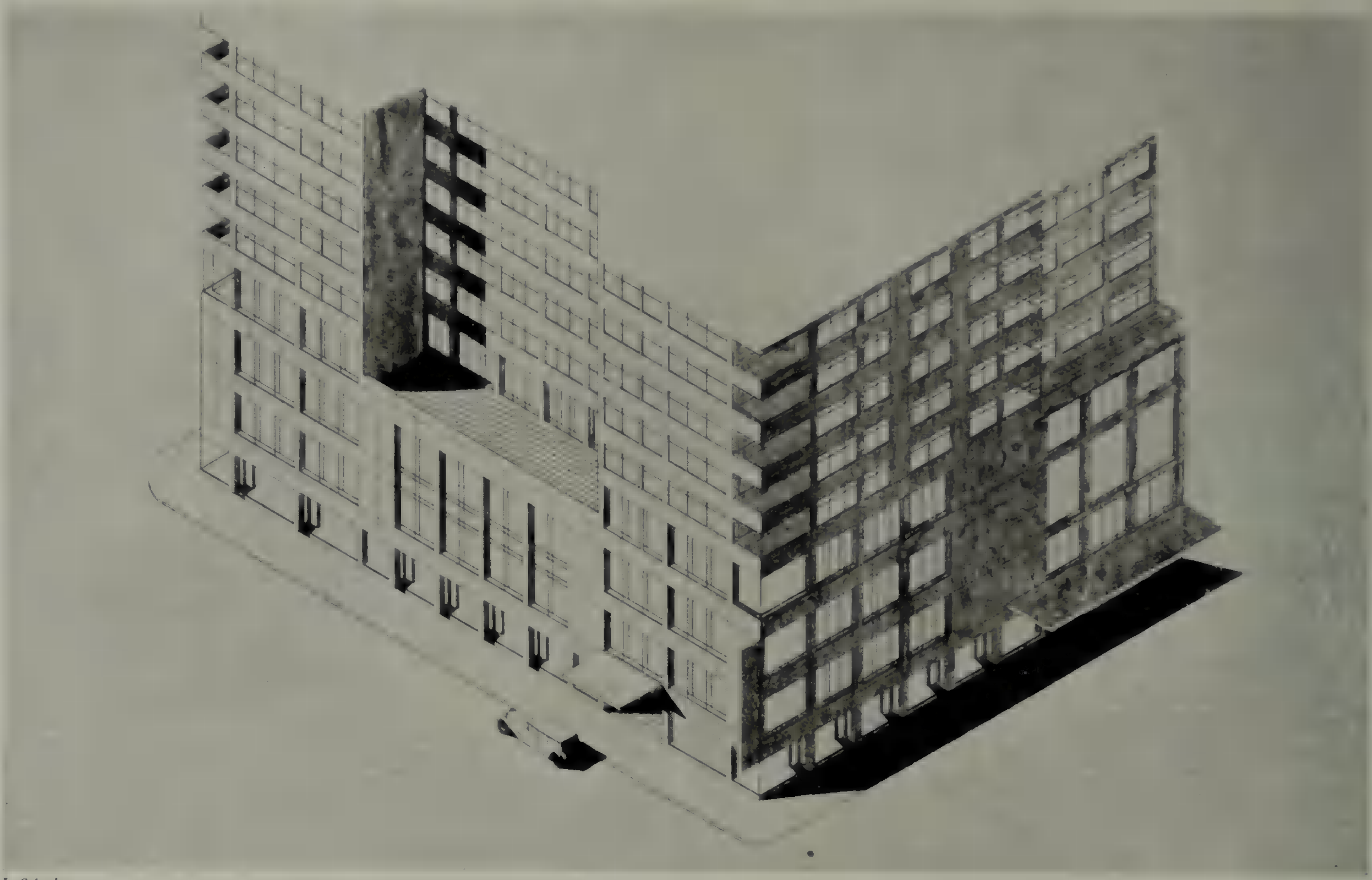
For hospitals which, at the present moment, can afford only the very smallest expense for the building of cubicles, there is the possibility of installing the cubicle frames, and in place of walls curtains of various materials on non-stretchable wire or rod can be substituted temporarily.

DESIGNS
BY
WILLIAM MUSCHENHEIM
NEW YORK

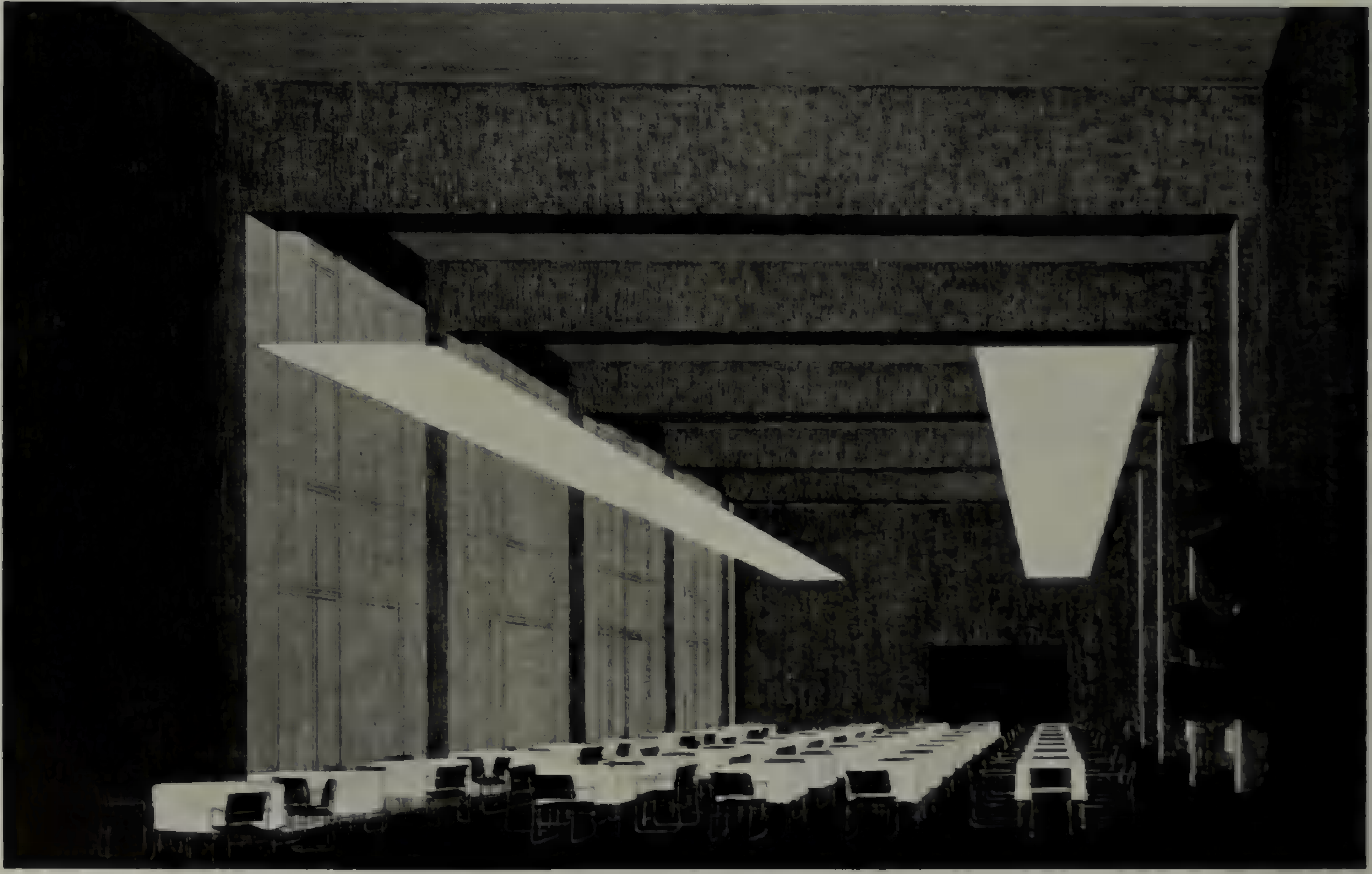


APARTMENT
HOTEL
NEW YORK CITY

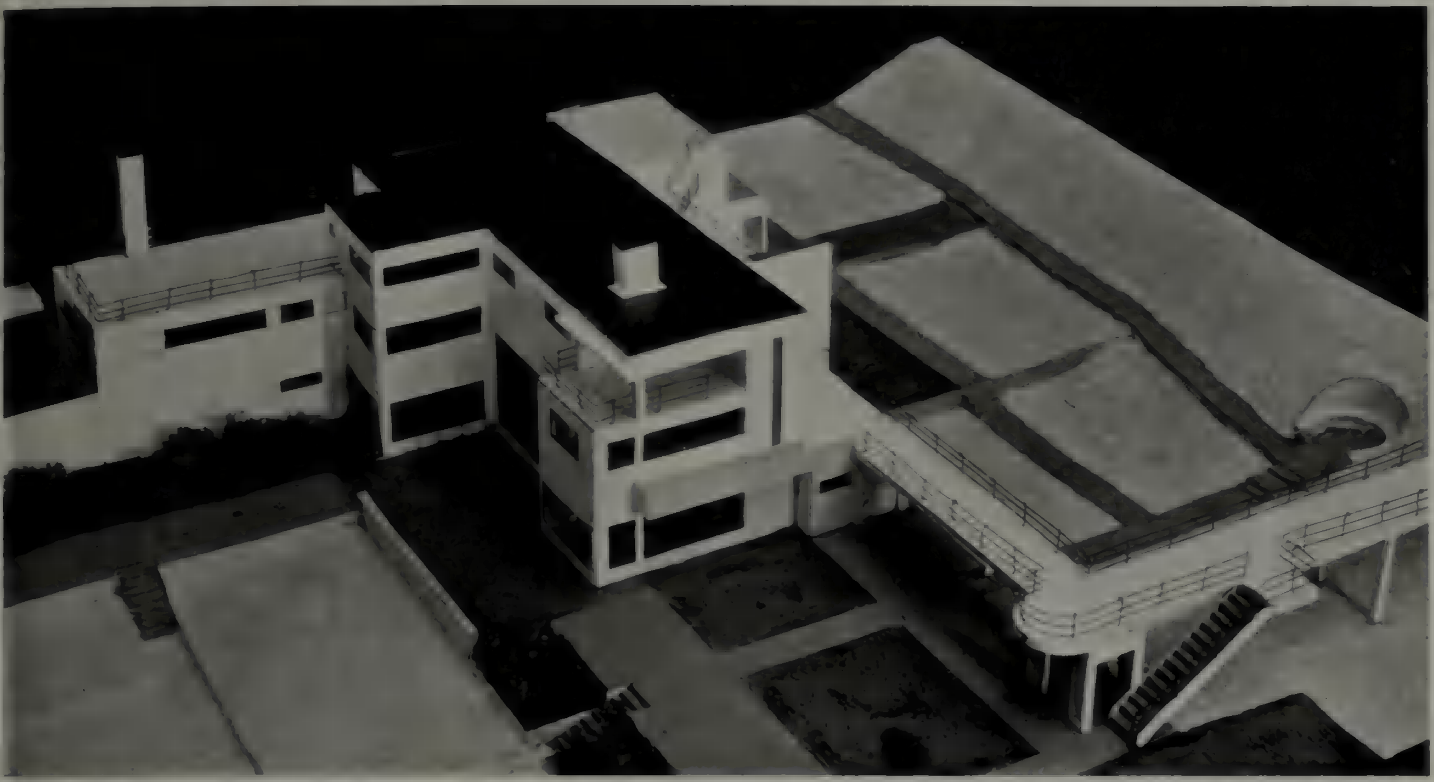
J. Scherk



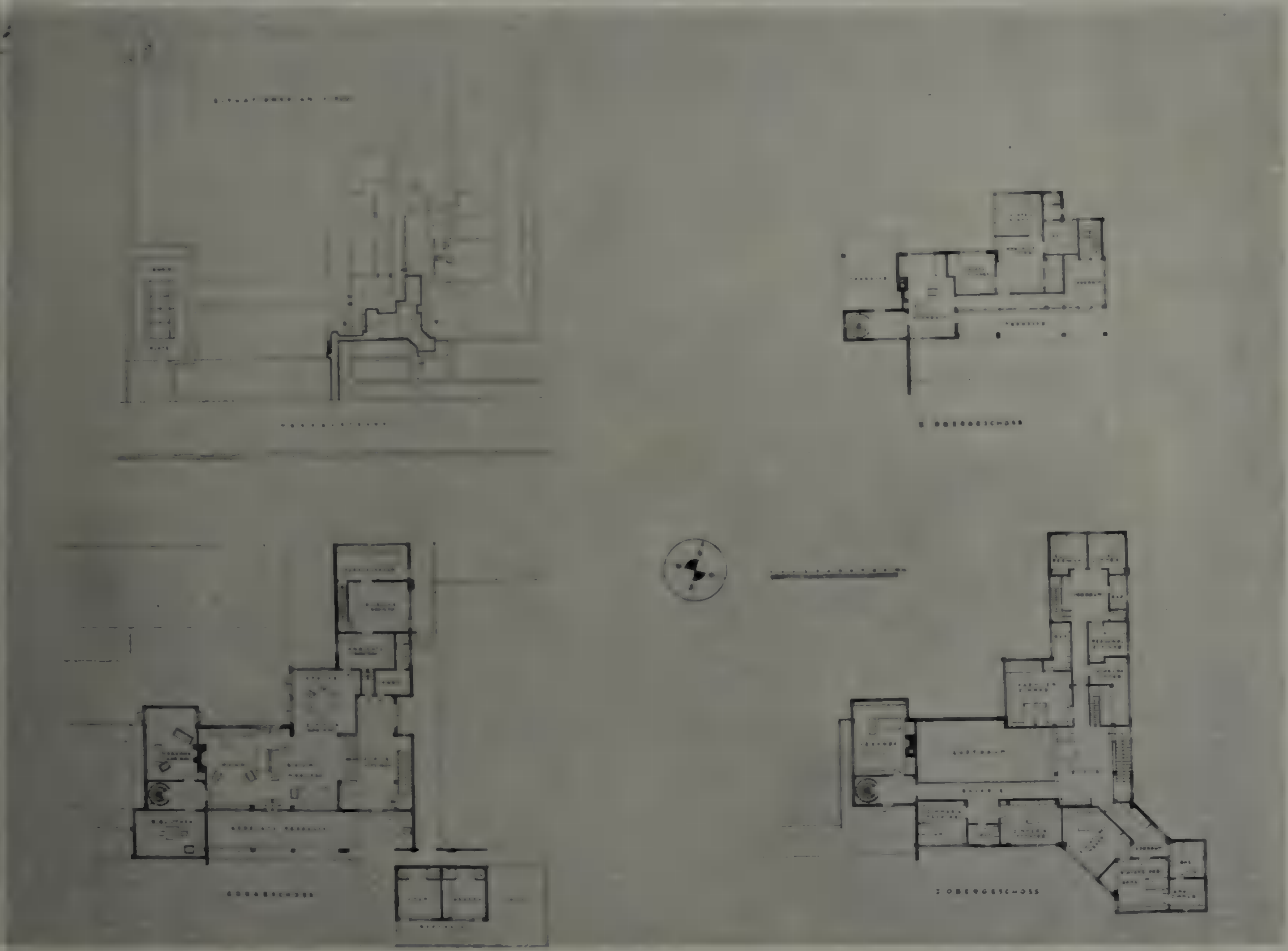
J. Scherb



APARTMENT HOTEL, NEW YORK CITY
WILLIAM MUSCHENHEIM, ARCHITECT
ISOMETRIC VIEW AND DINING ROOM

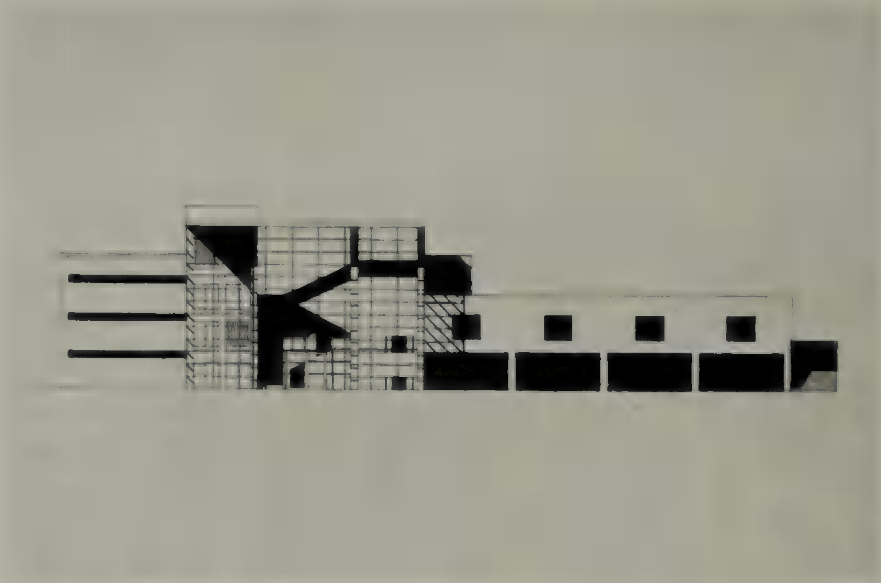


Nyholm and Lincoln

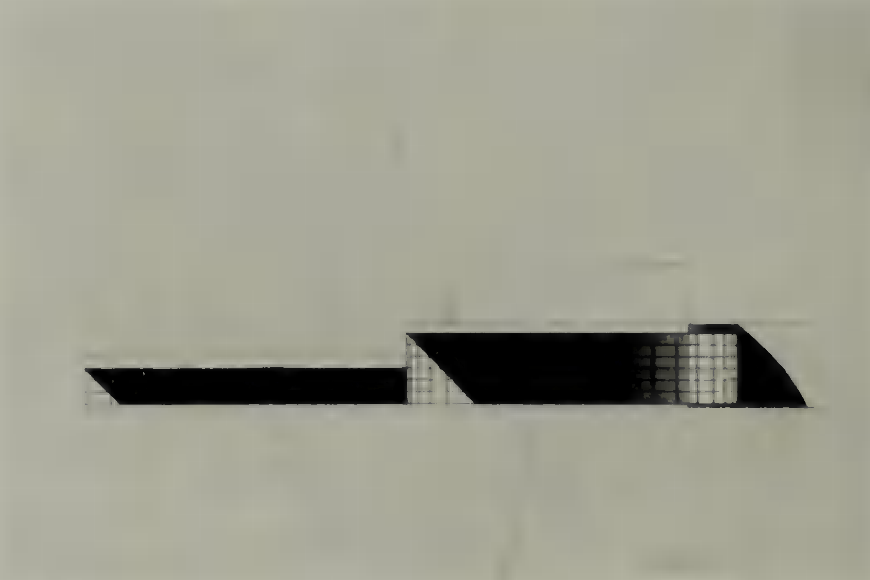


J. Scherb

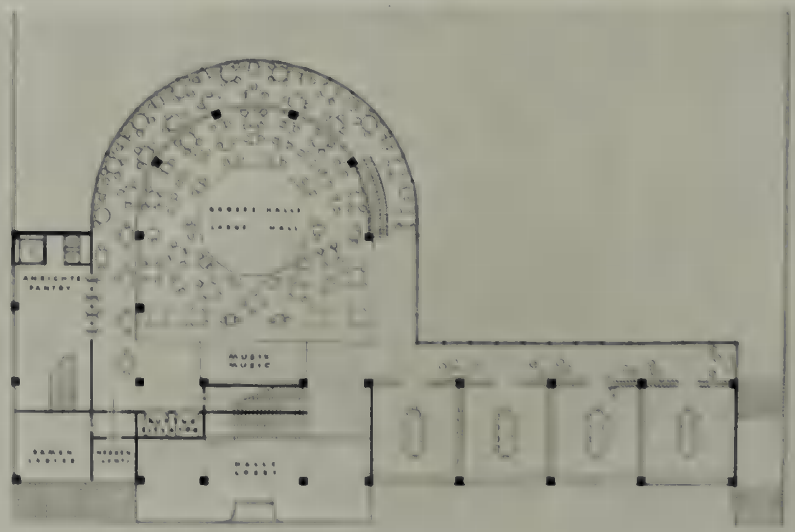
SUMMER RESIDENCE AT THE DUNES
LONG ISLAND, N.Y.
WILLIAM MUSCHENHEIM, ARCHITECT



NORTH ELEVATION

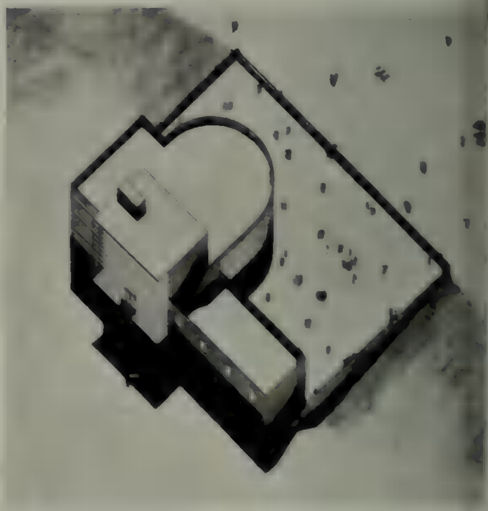


SOUTH ELEVATION

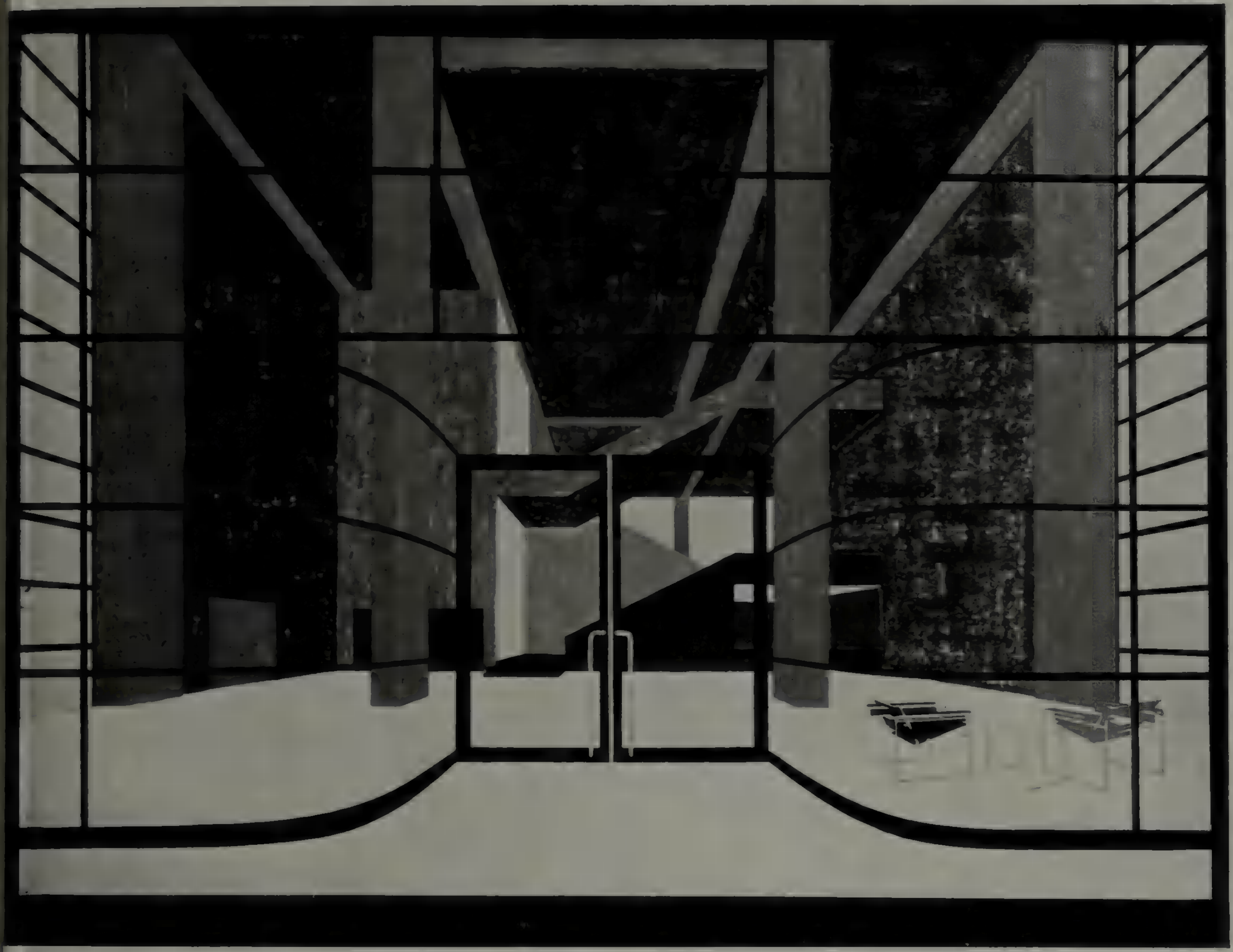


J. Scheck

MAIN FLOOR

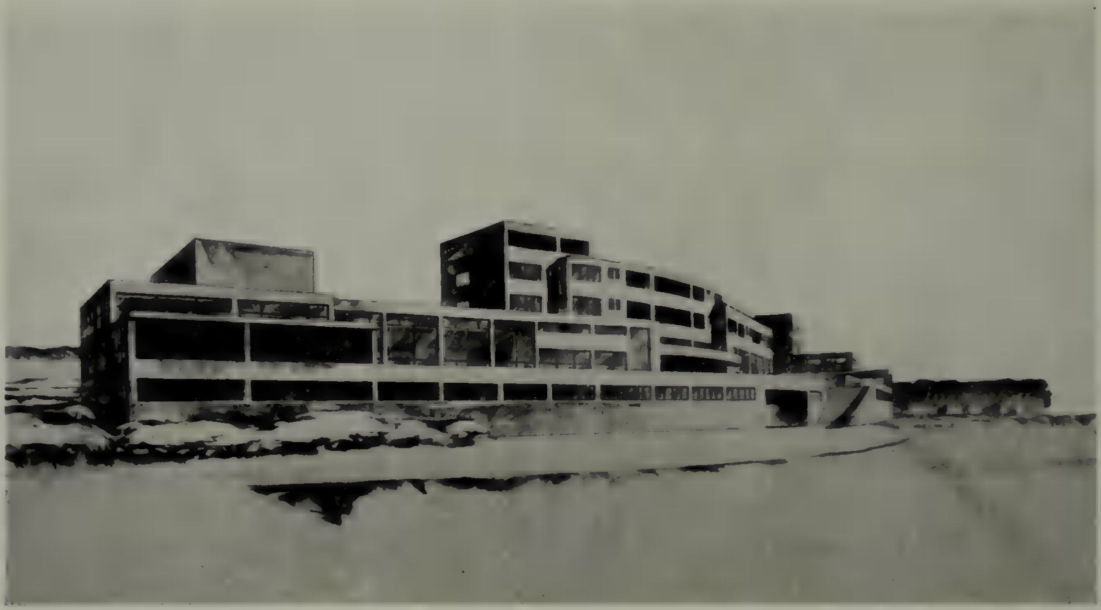


DANCE PAVILION AT THE SEA
LONG ISLAND, N.Y.
WILLIAM MUSCHENHEIM
ARCHITECT

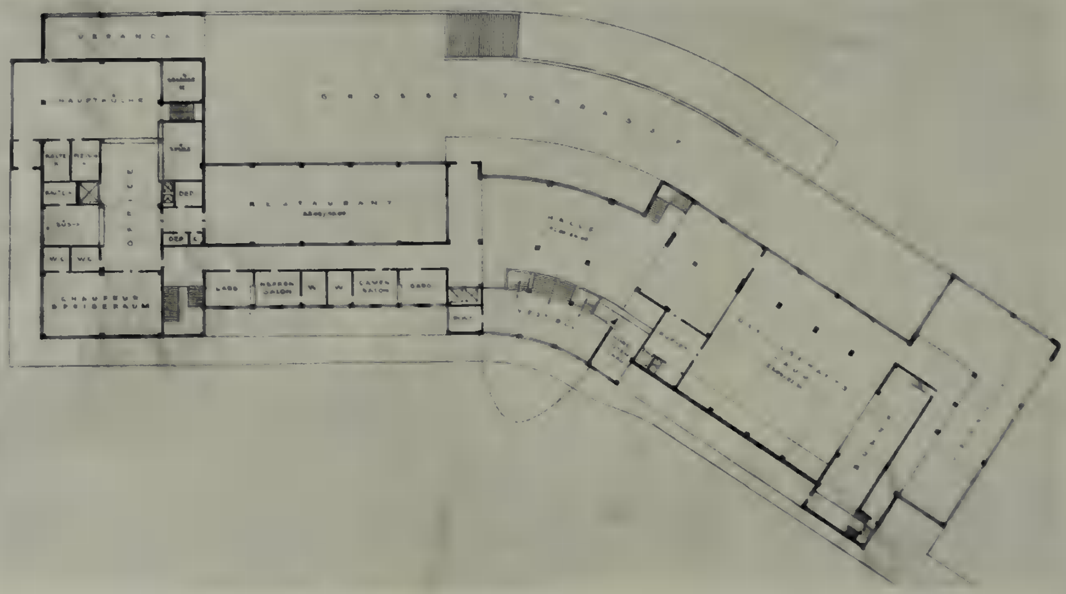


DANCE PAVILION AT THE SEA
MAIN ENTRANCE

WILLIAM MUSCHENHEIM, ARCHITECT



SOUTH ELEVATION



MAIN FLOOR

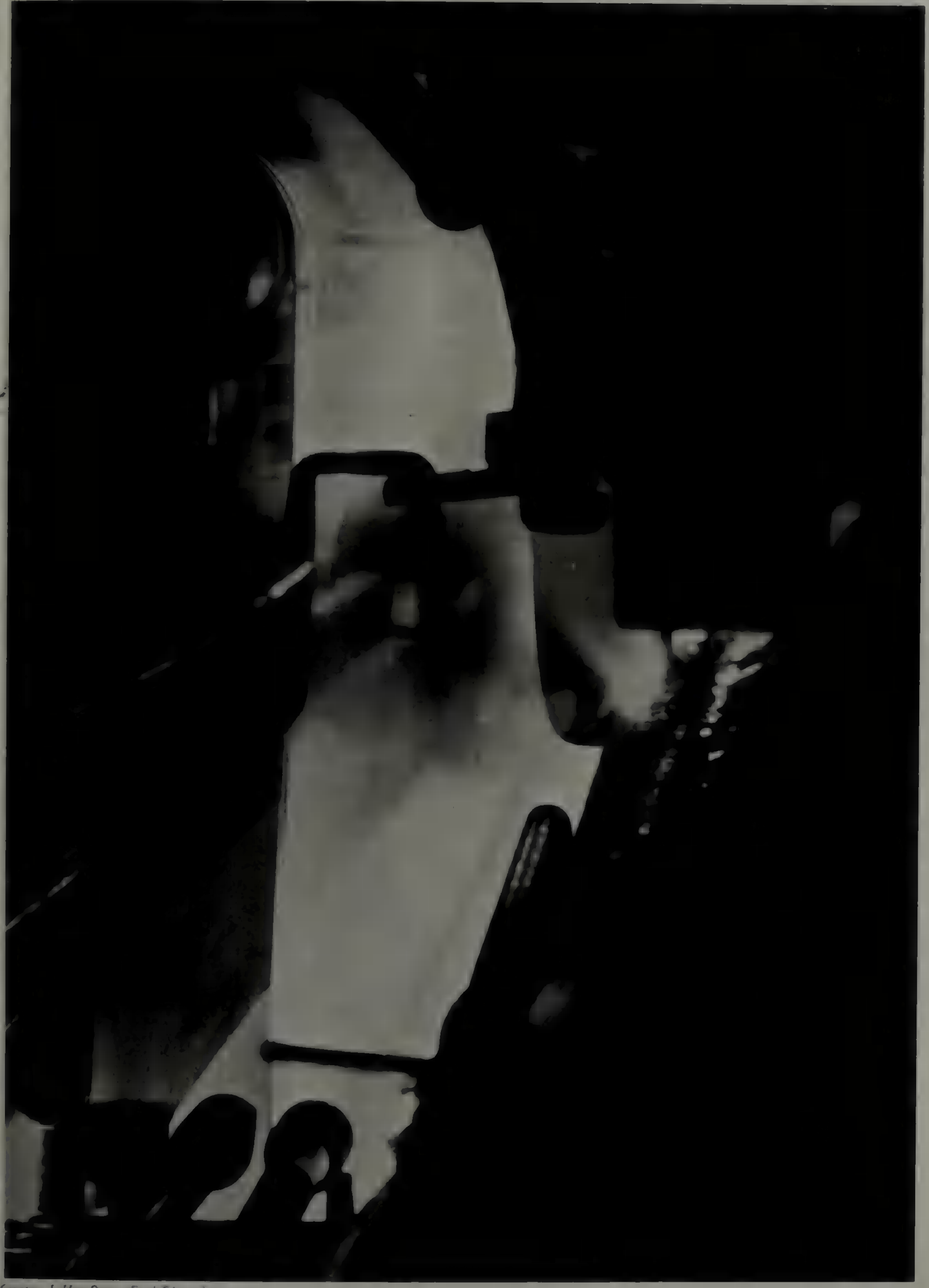
DINING ROOM

CLUB HOUSE, LONG ISLAND, N. Y.
WILLIAM MUSCHENHEIM
ARCHITECT

TECHNICAL NEWS AND RESEARCH

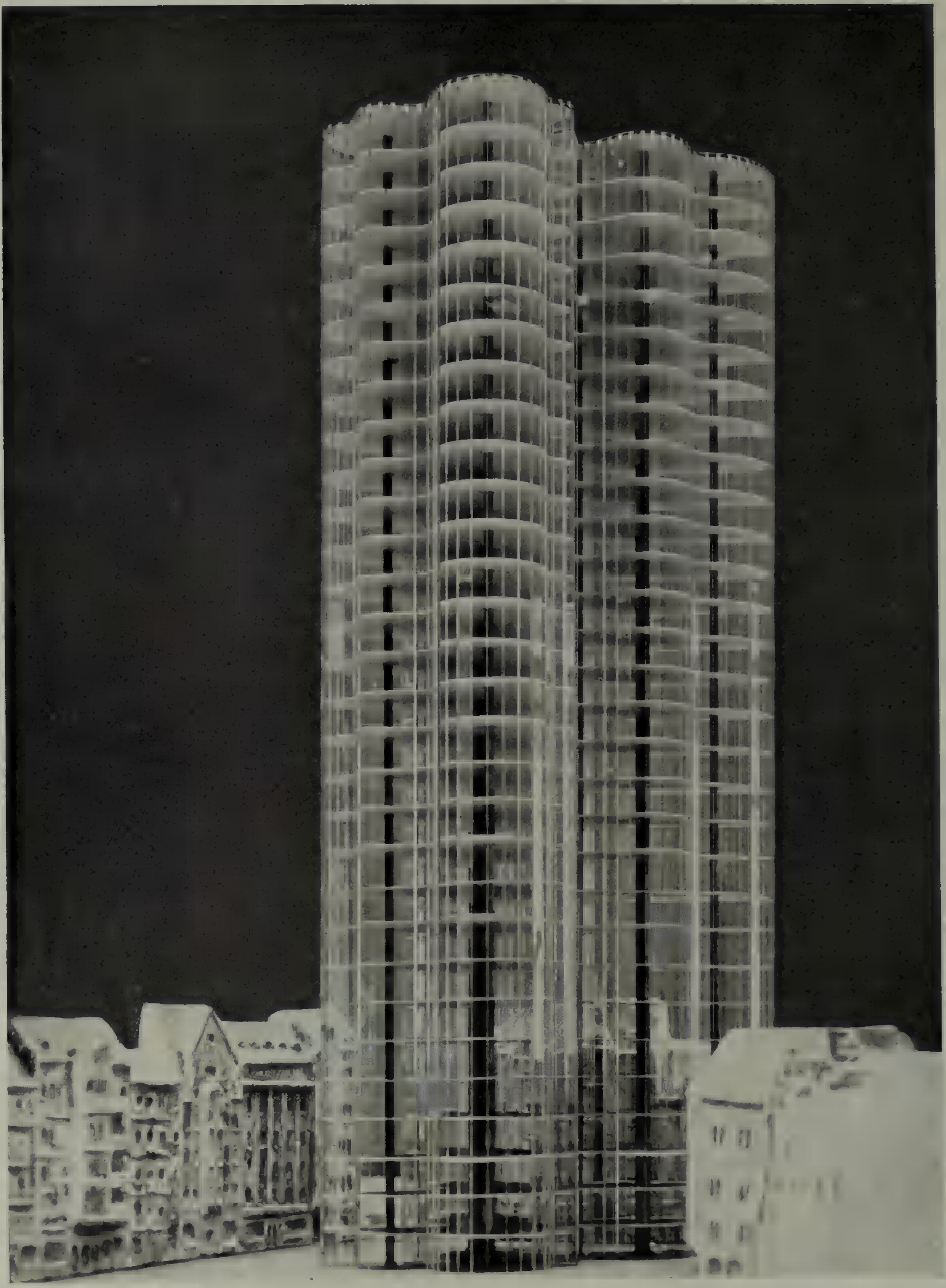
GLASS

BY
K. LÖNBERG-HOLM



Courtesy Libbey-Owens-Ford Glass Co.

MANUFACTURE OF SHEET GLASS



MODEL FOR OFFICE BUILDING, MIES VAN DER ROHE, ARCHITECT

PHYSICAL PROPERTIES OF GLASS

PERMEABILITY TO VISIBLE RADIATION

VOLUME OF TRANSMISSION

The volume of transmission varies with the following factors:

1. *Chemical properties of the glass*

The volume of light transmitted by glass is in direct proportion to the purity of its composition. No ordinary glass can transmit more than about 91% of the incident light. When a light ray strikes a plate glass vertically about 4% is reflected from its upper surface and about 3 or 4% from its lower surface; the remaining light being transmitted and absorbed. The amount of reflected light varies with the optical property of the glass known as the *refractive index* (the number which expresses the ratio of the sine of the angle of incidence to the sine of the angle of refraction) but this variation is a minor factor in the consideration of ordinary clear glasses, because of the small range of the refractive index. (From 1.45 to 1.96.)

2. *Nature and distribution of incident light flux.*

3. *Shape and reflection factor of the background or enclosure around the lightsource.*

4. *Angle of incidence.*

The percentage of light reflected increases with the angle of incidence (the angle between the light ray and a line perpendicular to the surface). (Fig. 1.) The percentage of light reflected increases very gradually up to about 45 degrees incidence. It then increases rapidly, becoming 100% at 90 degrees incidence. This is a very considerably loss in daylighting equipment as the transmission factor of even plain glass is less for light reaching it from many angles than for a perpendicular beam of light. Laboratory tests (1)* on daylight in relation to windows showed that filling a window opening with clear plate glass resulted in lowering the minimum illumination at the rear of the room by 42%, and it was concluded that this possibly was due to the amount of artificial skylight reflected back from the glass.

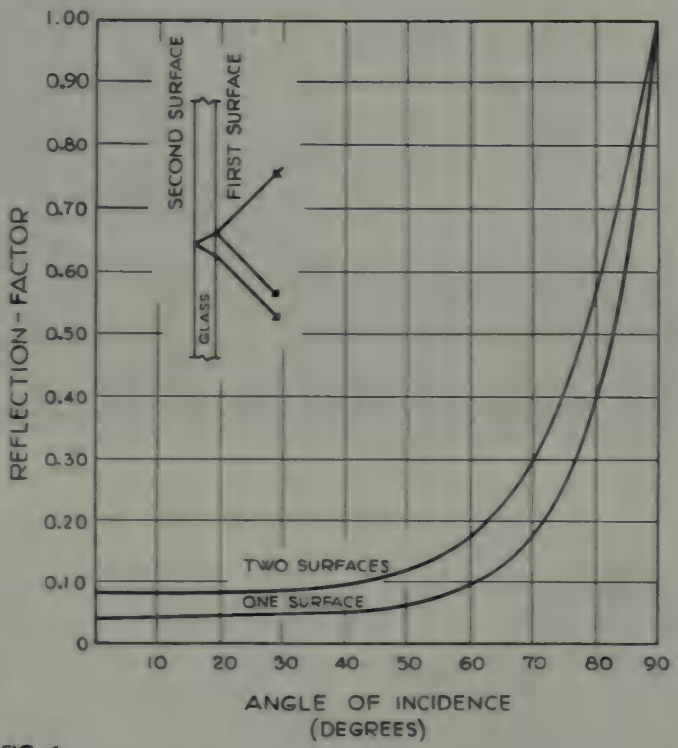


FIG. 1

PERCENTAGE OF INCIDENT LIGHT REFLECTED BY ONE AND TWO SURFACES OF CLEAR PLANE GLASS FOR VARIOUS ANGLES OF INCIDENCE (2).

5. *Facial characteristics*

Inasmuch as the transmission factor of a glass which is rough on one side (sandblasted, pebbled, ribbed or modelled) is appreciably less when the smooth side is toward the lightsource than when the rough side is, the transmission factor is given for both conditions in Table 1. Other considerations being equal these glasses should be used with their rough side toward the lightsource.

Specimen of Glass	Side Toward Lightsource	Transmission Factor	
		Perpendicular Beam	Hemispherical Illumination
Plane	....	0.90	0.80
Sandblasted	Rough	.78	.70
Sandblasted	Smooth	.74	.70
Pebbled	Rough	.85	.75
Pebbled	Smooth	.79	.75
Coarse Ribbed	Rough	.77	.62
Coarse Ribbed	Smooth	.52	.62
Fine Ribbed	Rough	.86	.79
Fine Ribbed	Smooth	.79	.79
Wavy	Rough	.88	.82
Wavy	Smooth	.86	.82

Table 1.

Transmission factors of typical glasses for direct and diffused light. (2).

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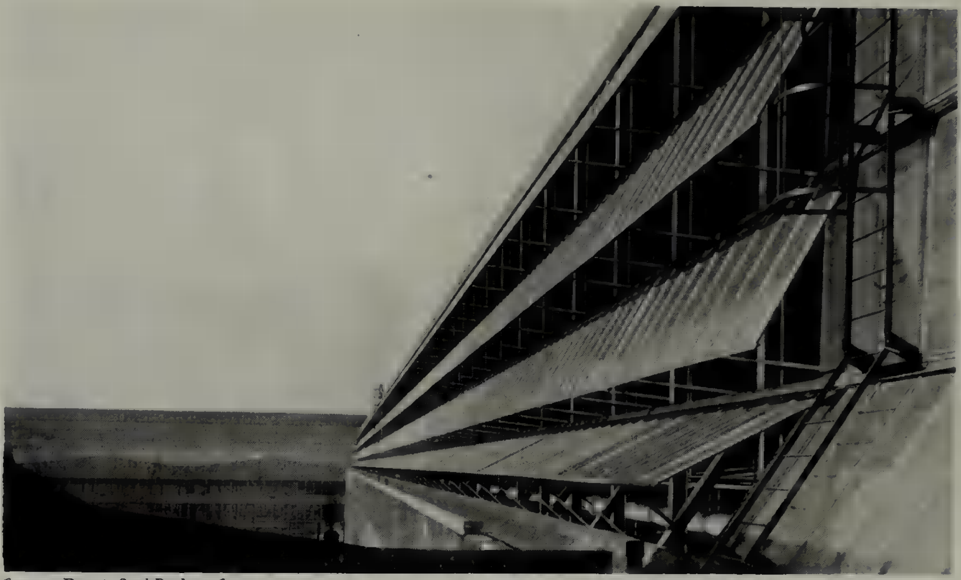
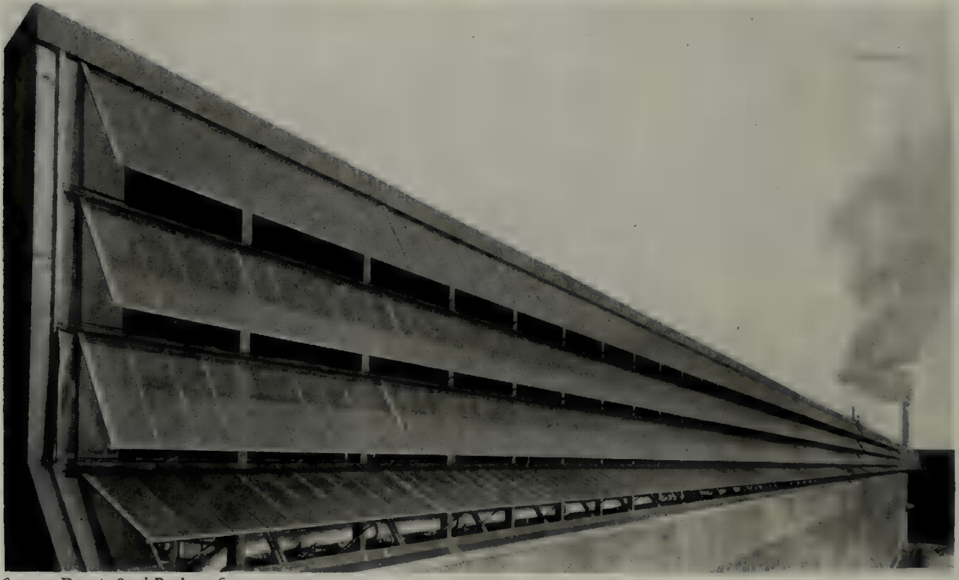
* Figures in parentheses throughout the text indicate references given at end of each chapter.



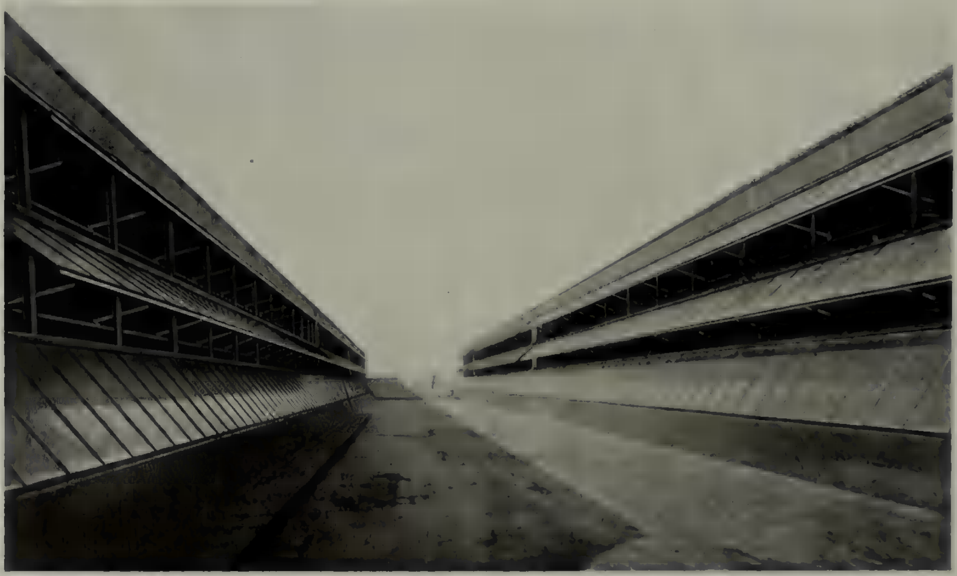
Courtesy Detroit Steel Products Co.

MONITOR, FORD MOTOR CO.
DEARBORN



Courtesy Detroit Steel Products Co.

MONITOR, FORD MOTOR CO.
DEARBORN



Courtesy Detroit Steel Products Co

MONITORS, LINK BELT CO.
PHILADELPHIA

Material	Light Reflected			Light Transmitted			
	In Concentrated Beam	In Spread Beam	Diffused in all Directions	In Concentrated Beam	In Spread Beam	Diffused in all Directions	Light Absorbed
Crystal Glass							
Clear	8–10*			80–85	.....	.....	5–10
Frosted or Pebbled (A)	4– 5	5–10	.....	.....	70–85	.....	5–15
Frosted or Pebbled (B)	.....	8–12	.....	.....	72–87	.....	5–15
White Glass							
Very Light Density (A)	4– 5*	.....	10–20	5–20	.....	50–55	8–12
Very Light Density (B)	.....	3– 4	10–20	.....	5–20	50–55	10–15
Heavy Density	4– 5*	.....	40–70	.....	.....	10–45	10–20
Mirrored Glass	82–88	.....	.....	.....	.....	.....	12–18

(A) Smooth side toward lightsource.
(B) Roughed on side toward lightsource.
* For angles up to 45 deg.; for angles greater than 45 deg. this value rises considerably.

Table 2.

Characteristics of materials.
(Courtesy: National Lamp Works, Nela Park, Cleveland).

6. *Surface dirt*

Dirt accumulations reduce the volume of light available for distribution. Measurements of intensities of illumination before and after cleaning the glass area in many cases show an increase as much as 5 to 10 times, and it is not uncommon to increase the illumination intensity in some parts of the interior from an average of one foot-candle with dirty glass to as high as 15 foot-candles (2).

FACTORS INVOLVED IN THE ACCUMULATION OF DIRT ON WINDOW GLASS

(a) Atmospheric conditions

Particularly in factory districts glass rapidly accumulates a film of dirt.

(b) Time and place of exposure

Investigations of dirt as related to daylighting in industrial buildings (3) have shown that the accumulation of dirt on a window over a given length of time is about 75% on the inside and 25% on the outside. Probably this is due to occasional rains which wash off some of the outside dirt. This point is particularly significant with relation to sloping windows or skylights, which are more difficult to wash on the inside than vertical windows.

(c) Angle at which the glass is placed

Sloping surfaces collect dirt more rapidly than vertical surfaces and these are therefore more efficient light-transmitting media over a period of time.

(d) Facial characteristics

The facial characteristics of the glass seem to have very little to do with the amount of dirt collected. While it was found (3) that various types of glass collected dirt in about the same quantities, some of them retained it more tenaciously when cleaning was attempted. In selecting a window glass this point should be carefully considered as the cleaning methods and perhaps the actual cost may depend upon the ease with which the accumulated grime may be removed.

Four types of glass are commonly used in industrial buildings (3):

1. *Clear Sheet*—transmission factor 82% when clean;
2. *Vertically Ribbed*—transmission factor 72% when clean;
3. *Horizontally Ribbed*—transmission factor 72% when clean;
4. *Rough or Hammered Wire*—transmission factor 78% when clean.

(In all cases it is assumed that the light is unobstructed and diffused.)

The report (3) concludes that with the collection of six months' dirt there is little advantage in any of these glasses over any other. Clear glass and rough or hammered glass are much easier to clean, however, than either vertically or horizontally ribbed glass. Under certain conditions, it is possible to

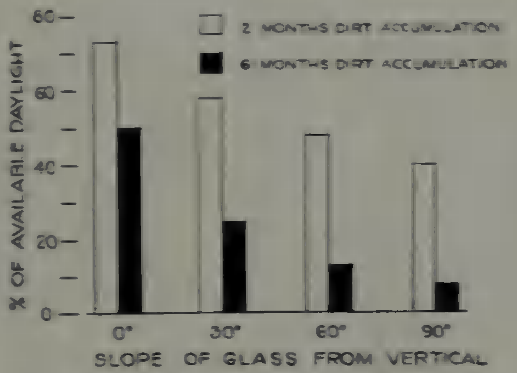
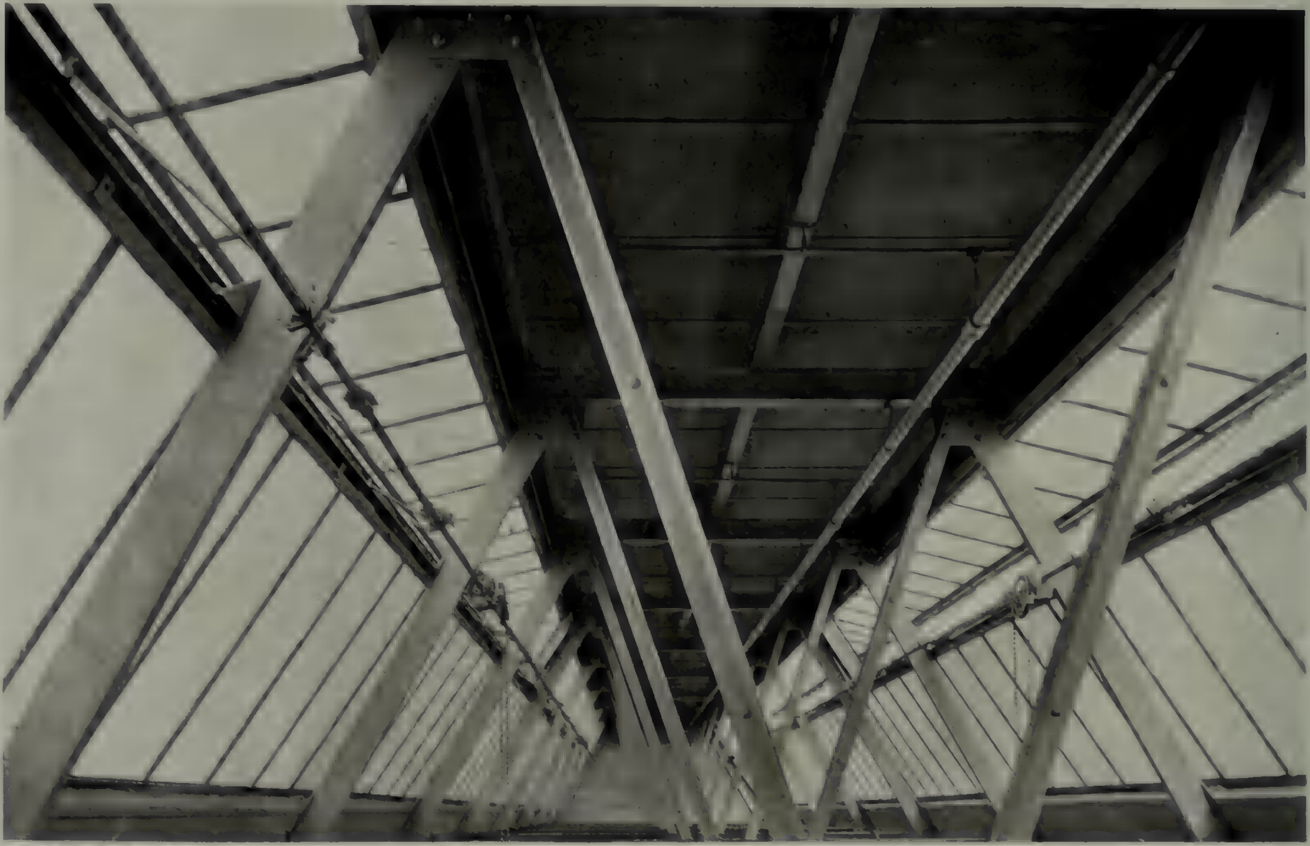
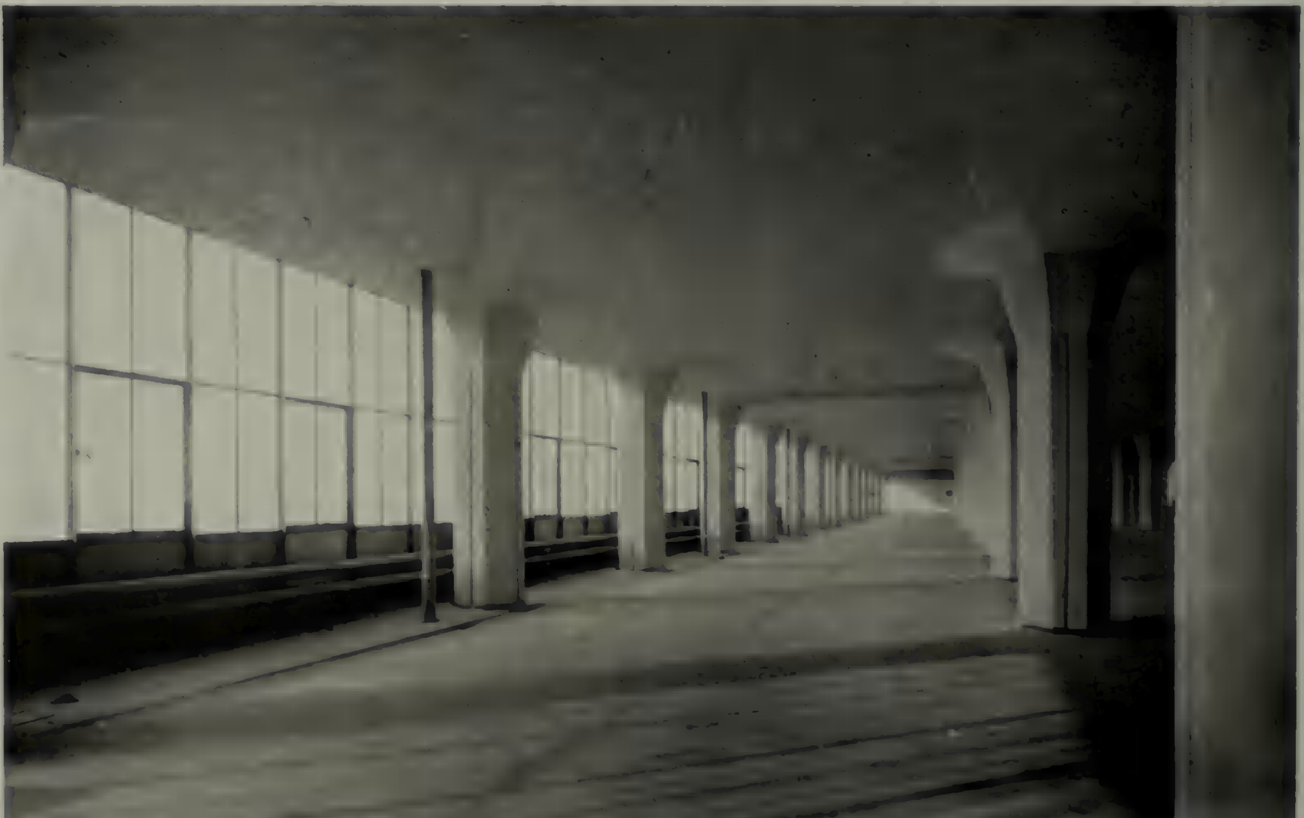


FIG. 2
RELATION OF DIRT ACCUMULATION TO SLOPE OF GLASS (3).



Courtesy The W. Bayley Co.

MONITOR, HALL PRINTING CO., CHICAGO



Kamman

VAN NELLE TOBACCO FACTORY, ROTTERDAM
J. A. BRINKMAN AND L. C. VAN DER VLUGT, ARCHITECTS

increase the minimum daylighting by using rough glass with the rough side in, this being especially true where the windows are somewhat obstructed on the outside by adjacent buildings. On the other hand, for practical purposes the rough side should be out since it is desirable to wash the inside oftener and the smooth glass is easier to wash than the rough.

If the windows are to be washed once a year only, as is the case in some industries, this should *not* be "spring-cleaning" but should take place in the fall so that the glass may be as efficient as possible when the need is greatest.

All daylighting values for industrial buildings should be figured on the basis of six months' dirt accumulation. (3)

CONTROL OF THE LIGHT FLUX

REFRACTION

When a beam of light enters glass obliquely from air the direction of its path is abruptly changed. The amount of this *refraction* depends upon the ratio of the velocities of the light as it passes through the two media. Advantage is taken of this property of glass to alter and to control the course of light rays. It is also possible to reflect all the light by means of glass prisms as shown in Fig. 3. After a ray of light enters glass it is totally reflected at a bounding plane if it is incident upon this plane at a sufficiently large angle. Prisms and lenses have an extensive use in lighting equipment, in refracting and breaking up light. Many designs of glass having prismatic forms are on the market. When properly designed and installed an appreciable control of natural light entering interiors is obtained. These glasses are usually employed for the purpose of gathering oblique light from the sky and sending it in a general horizontal direction into the parts of the room at some distance from the lightsource. Unless kept quite clean prismatic glass loses its value.

DIFFUSION

Diffusion (multiple refraction) of the light flux without glare can be obtained by:

(*a*) *Varying the chemical composition of the glass*

Highly diffusing glass such as opal, opalescent or "milk" glass diffuses about as much light outward as it does inward. (Fig. 4, 5.) If it is perfectly diffusing it reflects *more* light outward. If one holds a piece of this highly diffusing glass in the path of light rays, it is readily seen that the glass is fully as bright when viewed in the direction of the light rays as when viewed in a direction toward the lightsource. This means that about as much light is diffusely reflected outward (toward the lightsource) as is

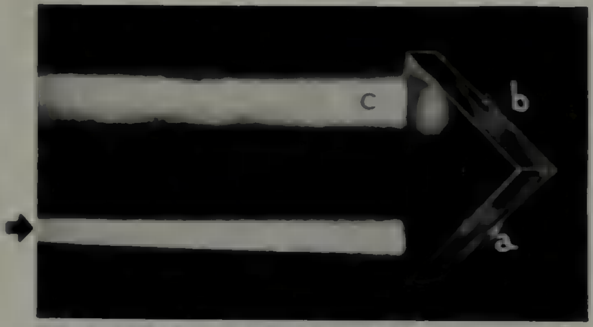


FIG. 3. TOTAL REFLECTION BY PRISM

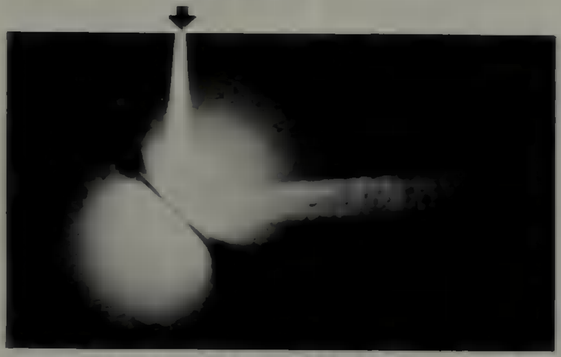


FIG. 4. REFLECTION AND TRANSMISSION BY WHITE OR MILK GLASS

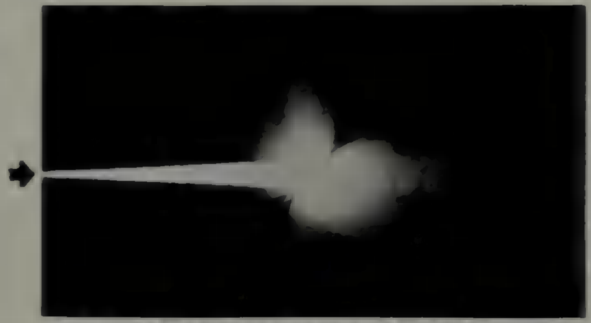


FIG. 5. TRANSMISSION AND REFLECTION OF WHITE GLASS. VERY LIGHT SAMPLE

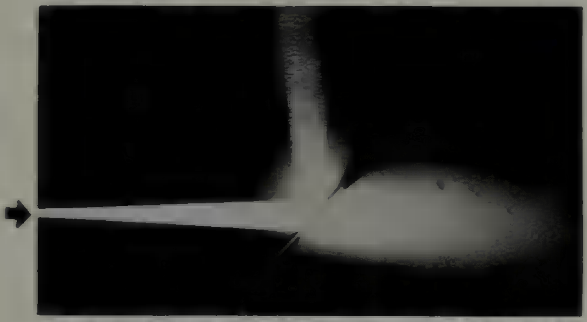


FIG. 6. REFLECTION AND TRANSMISSION BY ETCHED GLASS. SMOOTH SIDE TOWARD BEAM

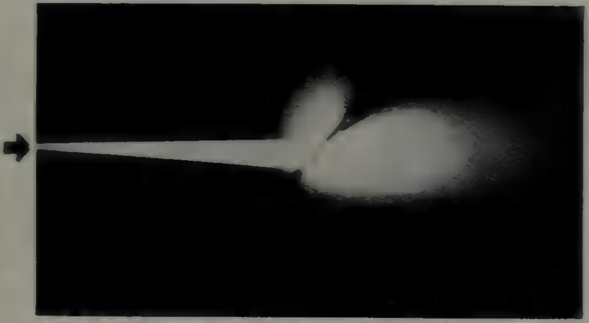
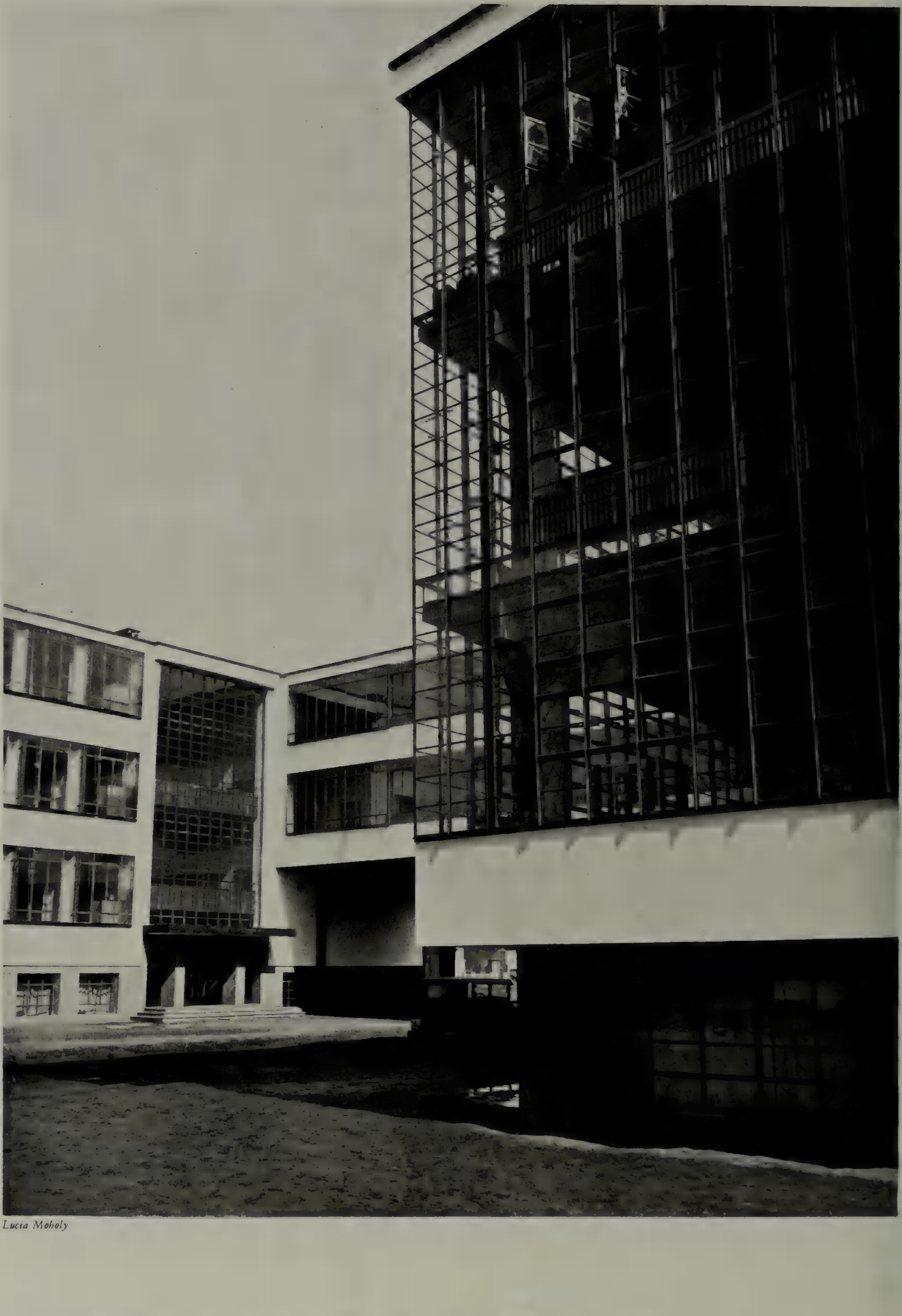


FIG. 7. REFLECTION AND TRANSMISSION BY ETCHED GLASS. FROSTED SIDE TOWARD BEAM

Courtesy National Lamp Works, Nela Park, Cleveland



Lucia Moholy

BAUHAUS SCHOOL, DESSAU, WORKSHOPS, WALTER GROPIUS, ARCHITECT diffusely transmitted inward. This is true to some extent, but not to the same degree, of sand-blasted or so-called "frosted" glass. (Fig. 6, 7.)

Type	Thickness In.	Diffusion	% Reflection	% Transmission	% Absorption
Clear........	.079–.157	None	6– 8	90–92	2– 4
Frosted Clear	.071–.130	Little	6–19	60–91	3–14
Ornamental .	.118–.177	Little	6–20	70–91	3–14
Opalescent . .	.071–.098	Little	13–28	59–84	3–13
Solid Opal . .	.051–.157	Good	52–74	10–38	6–24
Flashed Opal	.071–.122	Good	29–52	36–66	3–10
Alabaster . . .	.315–.630	Good	45–67	17–36	14–33

Table 3.

Diffusion, reflection, transmission and absorption factors for various glass. (4).

A loss of energy is connected with this diffusion. This light absorption is a function of the thickness and the chemical composition of the glass.

(b) Surface patterns

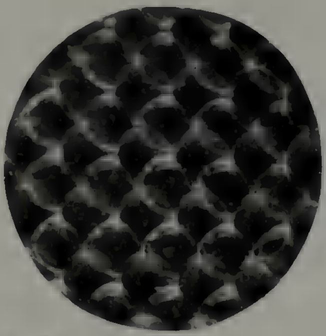
A moulded surface scatters the light flux. The chief functions of a surface pattern are to break up the direct rays from the lightsource and to redirect the light passed through.

Diffusion for the purpose of obstructing vision can be obtained by the use of rough, hammered or pebbled glass that spreads the light in an irregular manner.

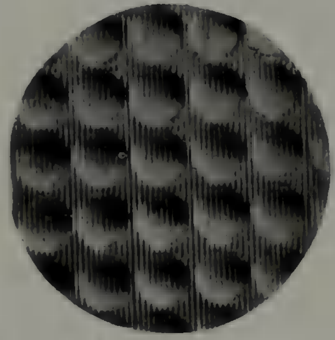
A great number of glasses are on the market with surface patterns designed for the highest transmission of light, for diffusion that reduces glare to a minimum and obstructs vision, and for controlled deflection.

The volume of transmission depends to a certain degree on the character of the flat surface of these glasses. A rolled surface is more or less rough. For full efficiency it should be ground and polished. The surface patterns should be shallow without grooves and sharp angles, for ease of cleaning. Ribbed glass spreads the light in a direction perpendicular to the ribs. Glasses with prismatic patterns or patterns composed of convex lenses spread the light equally in all directions.

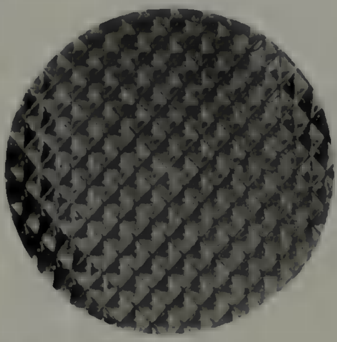
Laboratory tests on transmission of light through window glass (5) have proven the possibility of increasing the illumination on a horizontal plane in the back of a room by employing horizontally ribbed glasses. But it is generally found objectionable to face windows glazed in this manner as the contrast between the window and the surroundings is too extreme, especially where these windows face direct sunlight. By employing a glass which will completely break up the direct rays of the sun, the illumination, though of a lower intensity, may be more efficiently utilized.



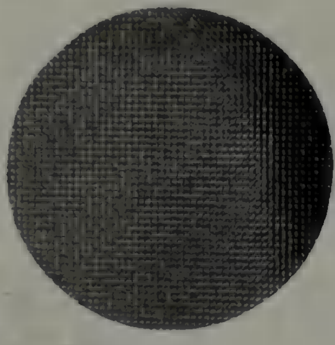
Manufacturer's Glass Co., Chicago



Manufacturer's Glass Co., Chicago



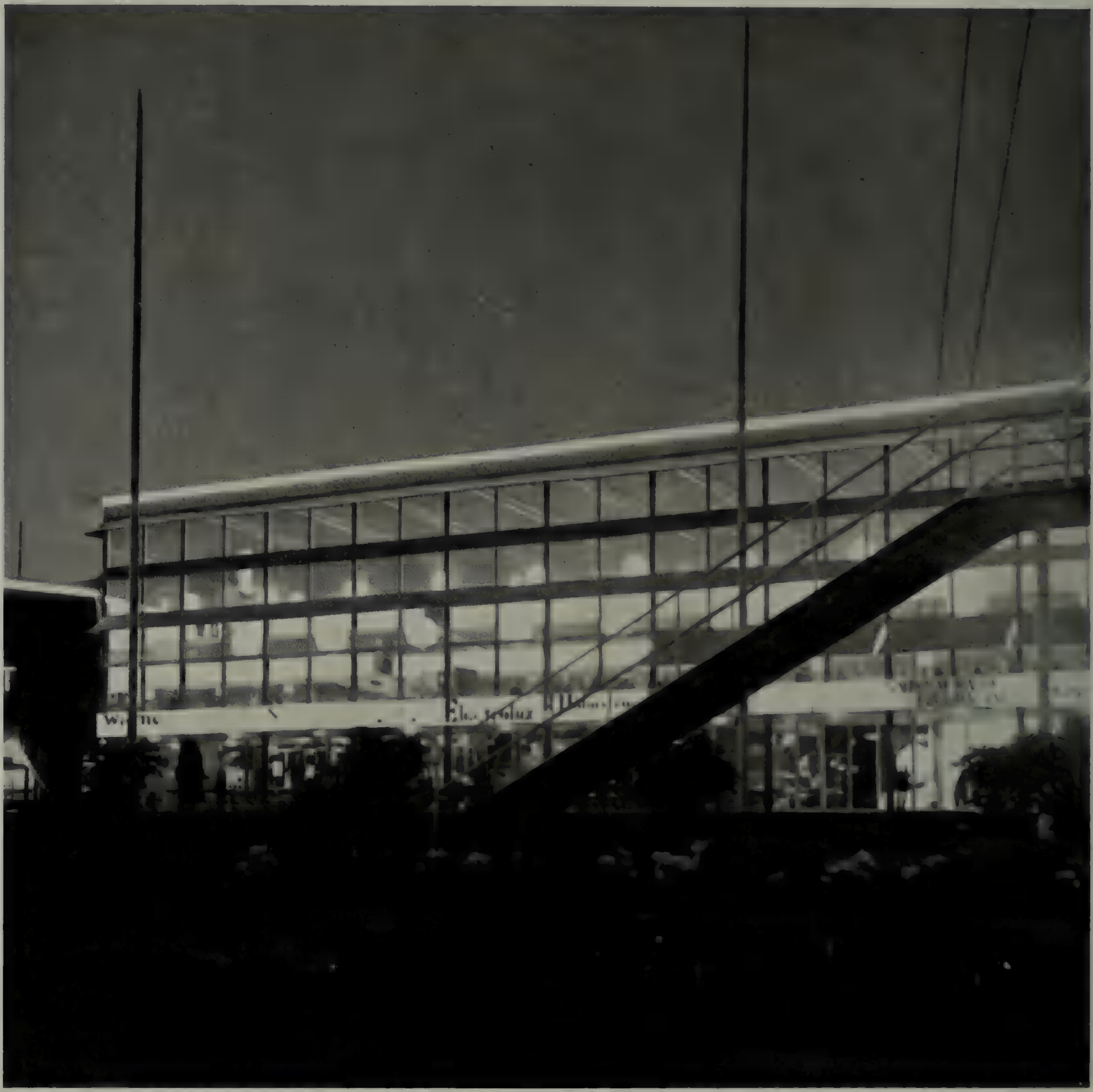
Mississippi Glass Co.



Mississippi Glass Co.

Mississippi Glass Co.

SURFACE PATTERNS FOR DIFFUSION AND CONTROLLED DEFLECTION



Barney

RESTAURANT, STOCKHOLM EXPOSITION, E. C. ASPLUND, ARCHITECT

The authors conclude that the large number of variations which are encountered in natural lighting problems must all be taken into consideration when selecting the glass which will give the best average results, and that upon the whole, glass of the type with a surface pattern that gives a uniform diffusion of sunlight appears to be most satisfactory throughout.

MIRRORS

Similar to the reflection characteristics of polished metal are those of mirrored glass. Figs. 8 and 9 show the path of a ray of light striking the surface of a commercial type of mirror with silvering on the back of the glass. A small part of the light is at once reflected by the polished surface of the glass without passing through to the silvered backing; the remainder passes through the glass to the silver, from which it is reflected through the glass again and out along a line parallel to the ray reflected from the glass surface. The fact that most of the light has to pass through the glass both to and from the reflecting surface makes the silvered mirror a less efficient reflecting surface than the polished silver itself. The loss in the glass depends, of course, on the quality of the glass. The deterioration of a polished metal reflecting surface in service is, however, a factor which often more than offsets its higher initial efficiency.

Special laminated glasses are on the market which will act as a mirror when viewed from the side of the lightsource, but will, to a certain degree, be transparent when viewed toward the lightsource. A fine metallic screen is placed between the two pieces of glass. These glasses are extensively used in speakeasies.

ABSORPTION OF LIGHT

Light absorption can be controlled by varying the chemical composition and the thickness of the glass. By coloring the glass the absorption can be limited to certain ranges of the spectrum. The transmission factor of colored glasses is to a certain extent a function of temperature.

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4. *Licht und Lampe*, p. 1112, Oct., 1929.

5. *Transmission of Light through Window Glass*, paper by E. H. Hobbie and W. F. Little in Transactions, Illuminating Engineering Society, September, 1926.

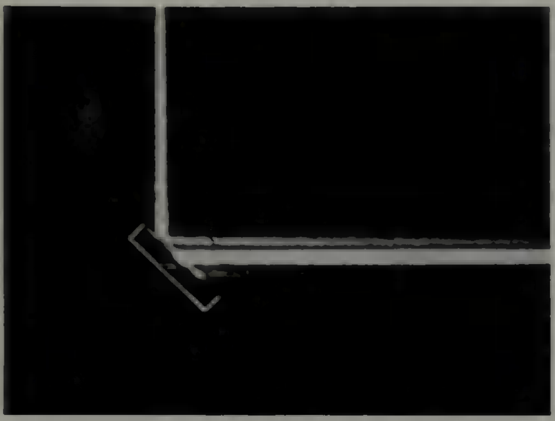


FIG. 8. REFLECTION FROM MIRROR

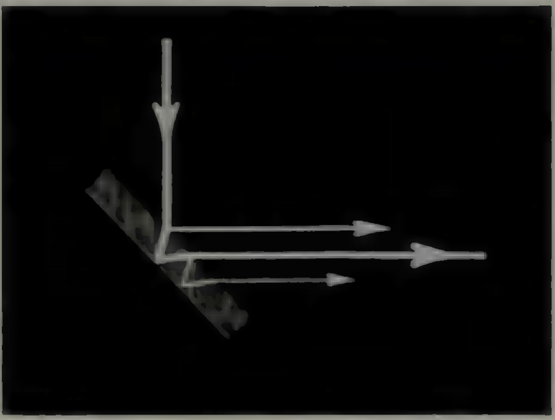


FIG. 9. DIAGRAM OF REFLECTION FROM MIRROR

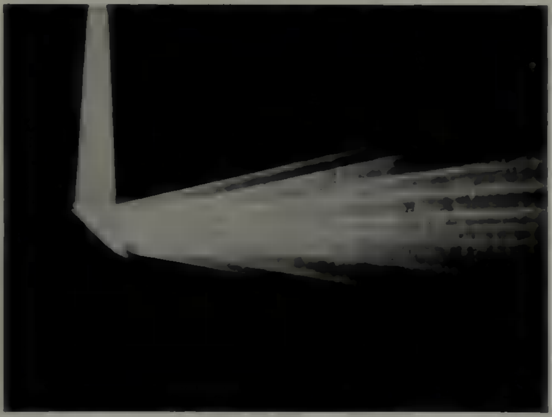


FIG. 10. REFLECTION FROM FLUTED MIRROR

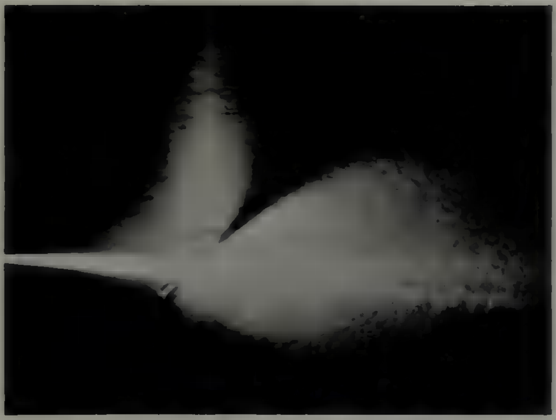
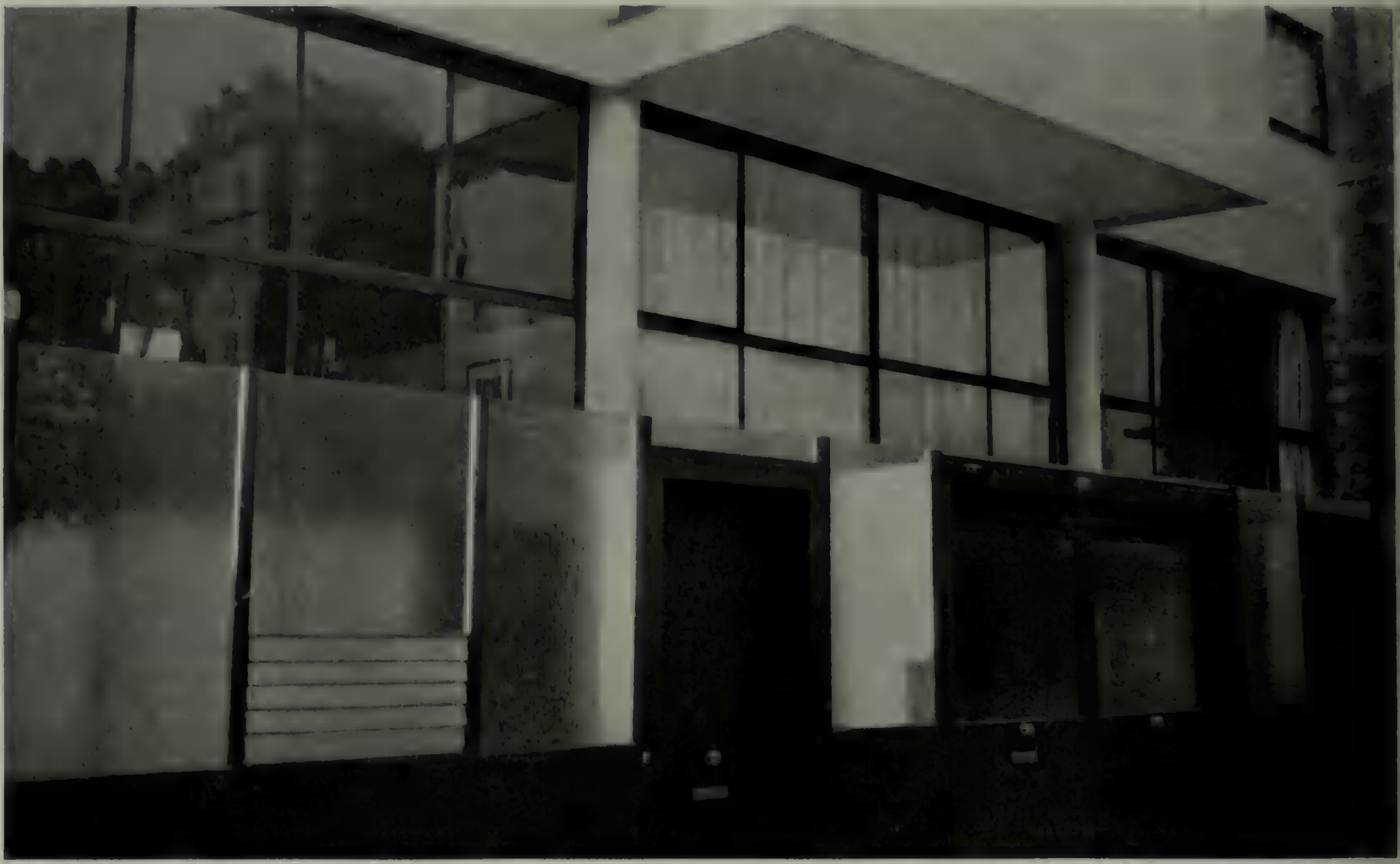
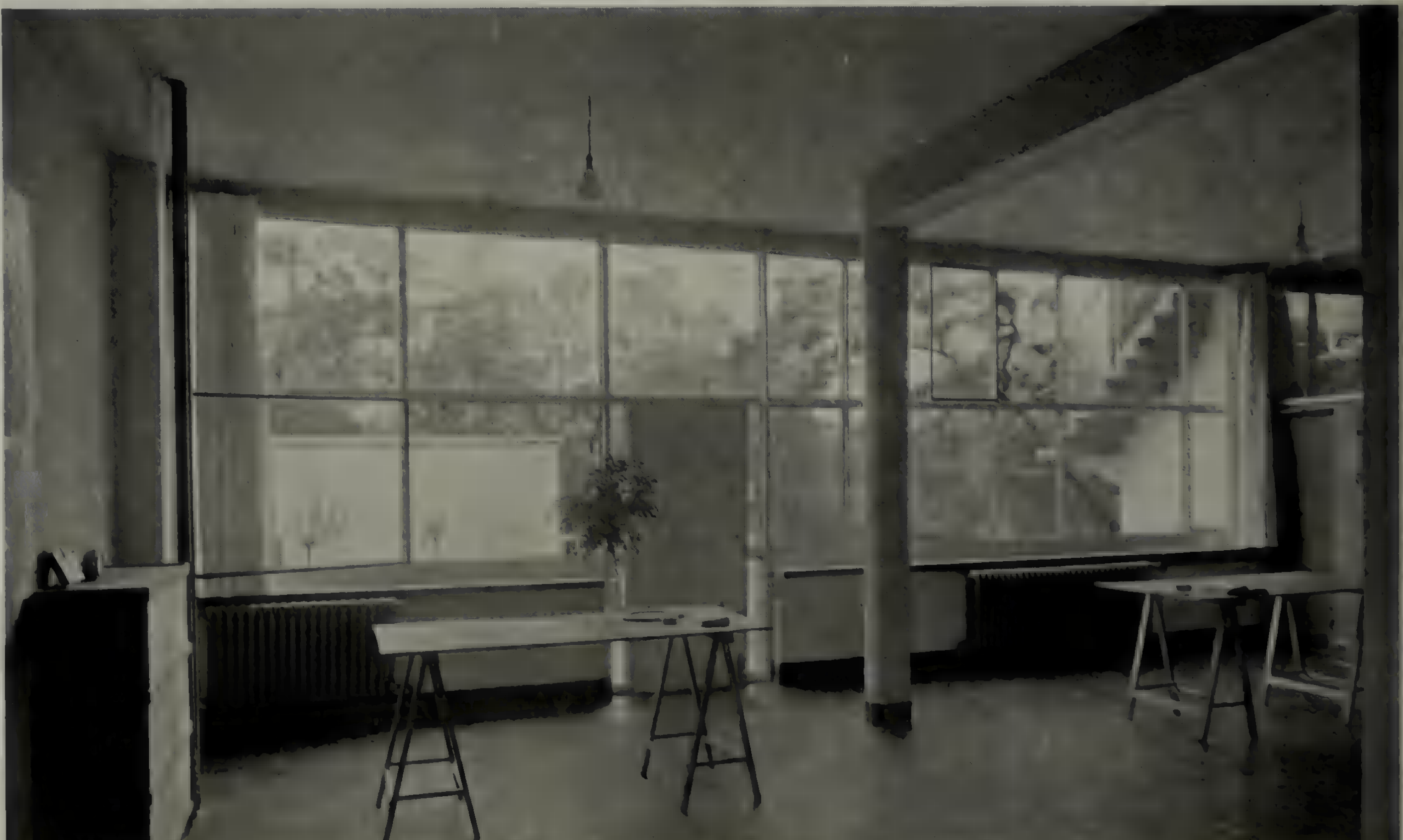


FIG. 11. REFLECTION AND REFRACTION BY FACTORY RIB GLASS

Courtesy National Lamp Works, Nela Park, Cleveland



ENTRANCE



STUDIO

PLANEIX HOUSE, PARIS, LE CORBUSIER AND P. JEANNERET, ARCHITECTS

PERMEABILITY TO SHORT WAVE LENGTH ULTRA-VIOLET RADIATION

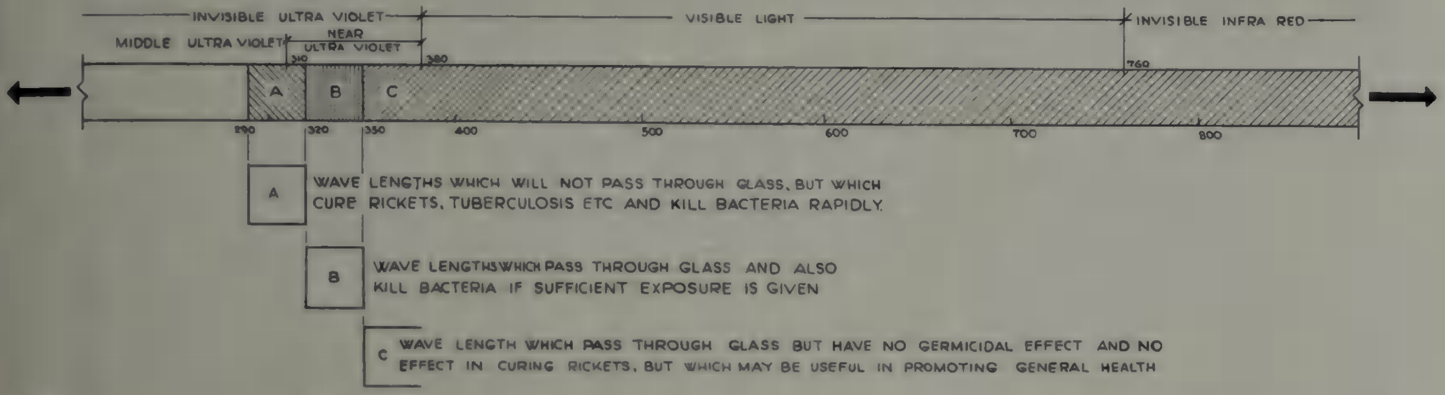

INVISIBLE ULTRA VIOLET
VISIBLE LIGHT
INVISIBLE INFRA RED
MIDDLE ULTRA VIOLET
NEAR ULTRA VIOLET
310
380
760
A
B
C
290
320
350
400
500
600
700
800
A
WAVE LENGTHS WHICH WILL NOT PASS THROUGH GLASS, BUT WHICH CURE RICKETS, TUBERCULOSIS ETC AND KILL BACTERIA RAPIDLY.
B
WAVE LENGTHS WHICH PASS THROUGH GLASS AND ALSO KILL BACTERIA IF SUFFICIENT EXPOSURE IS GIVEN
C
WAVE LENGTH WHICH PASS THROUGH GLASS BUT HAVE NO GERMICIDAL EFFECT AND NO EFFECT IN CURING RICKETS, BUT WHICH MAY BE USEFUL IN PROMOTING GENERAL HEALTH

FIG. 12

DIVISION OF SOLAR RADIATION WITH INDICATIONS OF THE BANDS OF WAVES WHICH WILL PASS THROUGH ORDINARY WINDOW GLASS AND WHICH ARE OF THERAPEUTIC VALUE. WAVE LENGTHS ARE MEASURED IN MILLIMICRONS (mμ). A MILLIMICRON IS ONE-MILLIONTH OF A MILLIMETER (1).

SIGNIFICANCE

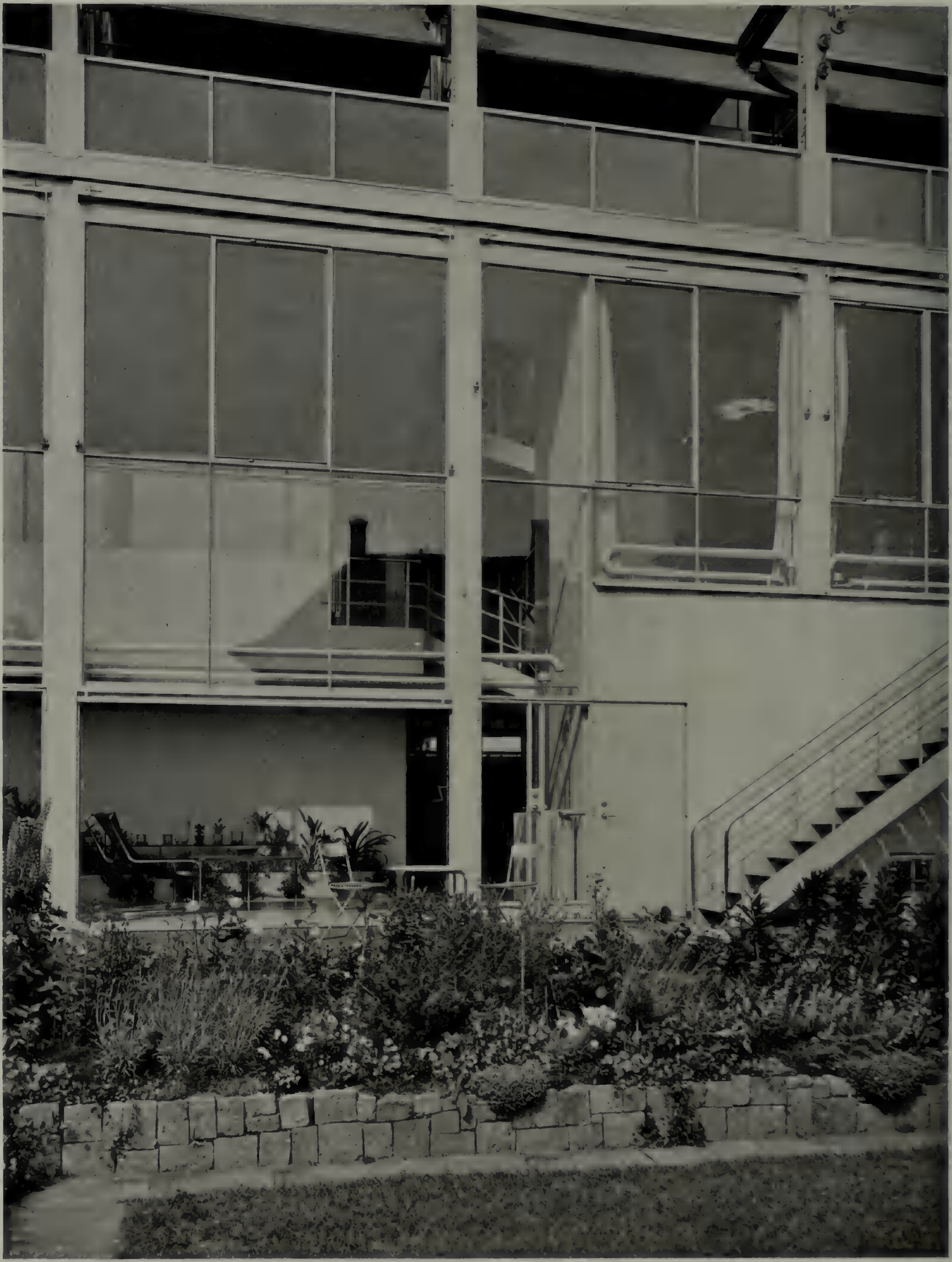
In general any material body or fluid is not transparent to radiant energy of all wave lengths. Ordinary clear glass is quite transparent to visible radiation or light but is opaque to ultra-violet radiation of the "middle" ultra-violet region (Fig. 12). The exact value of the amount of ultra-violet shut out by ordinary glass depends greatly upon the transparency of the sample of glass selected. Biologists have proven that the ultra-violet rays shut out by ordinary window glass have a special therapeutic value, especially in preventing rickets. (The rays necessary to the manufacture of vitamin D, the vitamin that controls the utilization of lime in bones, blood and tissues). Biological researches show that the strong emission line at 313 mμ has only a slight or doubtful value in preventing rickets (2) and that ultra-violet rays of longer wave lengths have no antirachitic potency. Since in the wintertime in the northern latitudes the short wave length limit of solar radiation is about 305 mμ, it appears that the spectral range of ultra-violet solar radiation useful for therapeutic purposes in preventing rickets is only 5 to 10 mμ in width. (2). The beneficial effect depends upon the time of exposure, transmissibility of the glass and intensity of the active rays. The transmissibility of glass can be extended toward shorter wave lengths so as to include the beneficial rays. It varies as a function of:

(a) Chemical composition

Various kinds of glass which are permeable to ultra-violet radiation in varying degrees are now on the market. The actual percentage of transmission of this portion of the spectrum permitted by these glasses has been determined by the Bureau of Standards (2) and biologically by the Council on Physical Therapy of the American Medical Association (3). The last-mentioned report concludes that glasses are now available which satisfactorily meet the requirements of permeability to the requisite ultra-violet radiation together with protection against the weather. The question of decrease (see below under SOLARIZATION) in this transmission of ultra-violet radiation suffered by these glasses upon exposure to light had not been brought up at the time of this report by the Council on Physical Therapy. Since then it has been investigated by the Bureau of Standards. (2.)

The Bureau of Standards (2) calls attention to the necessary correlation between the biological data and the physical measurements. The question of QUALITY of light, the proper combination of ultra-violet, visible and infra-red, enters into the efficiency of these special glasses.

The report by the Bureau of Standards (2) mentions a tendency among some distributors of these ultra-violet transmitting glasses to include 320 mμ or even longer wave lengths of the ultra-violet in the spectral range of therapeutic activity and that the inclusion of these wave lengths leads to an incorrect appraisal, as it gives a higher average transmission than seems warranted, when it is recognized that the greatest therapeutic activity occurs in the 302 mμ range of wave lengths shut out by ordinary window glass. Furthermore, since different samples of common window glass transmit from 2 to 20% at 320 mμ there is no special reason for including this wave length in the specification of these ultra-violet transmitting glasses. The report concludes that if the rays at 320 mμ have a



HOUSE VAN DER LEEUW, ROTTERDAM, BRINKMAN AND VAN DER VLUGT, ARCHITECTS special healing value there would be no need of using special ultra-violet transmitting glass instead of selecting the least greenish (as viewed edgewise) samples of common window glass, which would serve the purpose as well, at a considerable saving in cost.

The necessity of keeping the ultra-violet transmitting glasses clean is indicated by the observations that dirt and dust can reduce the transmission at 302 mμ by 30 to 40 per cent. (2.)

(b) Thickness

The Bureau of Standards (2) gives the following data on heavy wired glass which is of importance for safety in the case of breakage when used on a sloping roof. From calculations on samples of glass which for a thickness of 2.3 mm. transmits 20 to 30%, and from direct observations, it was found that thick (6 mm., one-fourth inch wired) samples of this type of glass transmit only 3 to 5% at 302 mμ. It is shown that this transmission is too low for biological use. Hence, if thick samples must be used for safety, it is concluded that it is necessary to use material that has little or no absorption at 302 millimicrons. Otherwise it will be necessary to use single thickness (2.3 mm.) glass backed with a 1-cm. wire mesh, which shuts out about 10% of the total light.

REFLECTION AND REFRACTION

The reflecting power of these glasses is no higher than that of ordinary glass. All these glasses decrease rapidly in transmission for wave lengths shorter than 365 mμ with increasing thickness. When the thickness is increased to ¼ inch or thicker the transmission is greatly reduced. For thick prisms the transmission would be much lower. Silver has a low reflection (4%) at 320 mμ and hence, unless a better metal can be found, these special window glasses cannot be used for mirrors.

SOLARIZATION

Solarization is the designation of the photochemical reaction that most of these special glasses undergo on exposure to sunlight. A decrease in transmission of ultra-violet radiation occurs as the result of exposure to ultra-violet radiation from artificial sources and from the sun.

The solarization is essentially a problem in photochemistry, which is a function of:

(a) Time of exposure

The rate of solarization decreases rapidly with the time of exposure so that although the drop in transmission during the first day may seem alarming, it is much less during the second day and so on. It is to be noted that as a result of solarization the transmission decreases to a permanent value (2). The time of solarization, the exposure necessary before the glass reaches its permanent transmissibility value, varies with the different glasses. No doubt the time will come when new glasses which will not change in transmission will be on the market. In the meantime it will be necessary to take into consideration possible changes in the short wave length ultra-violet transmission.

(b) Temperature

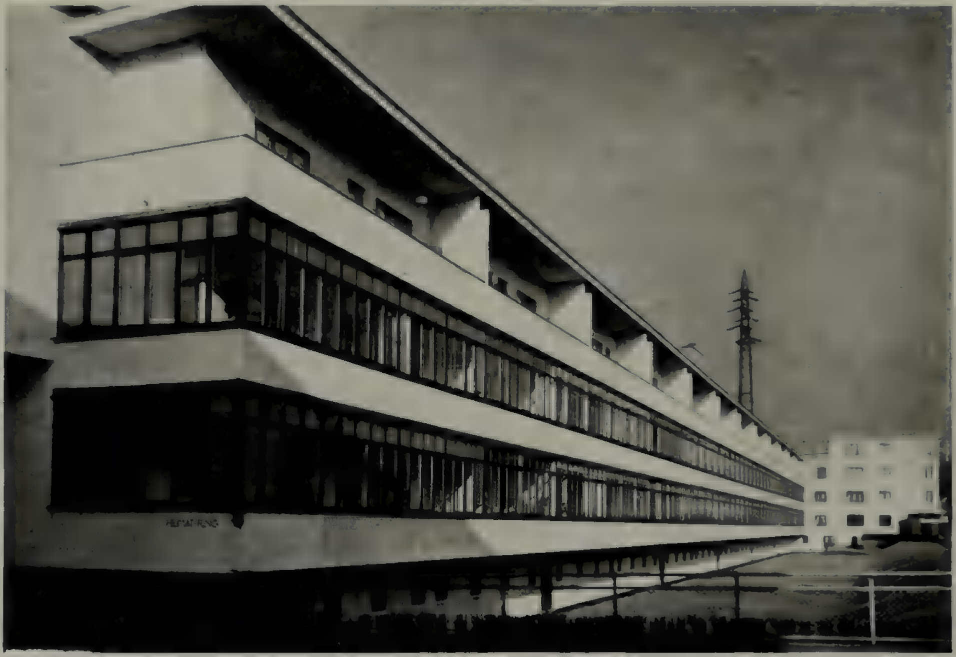
The Bureau of Standards calls attention to the fact that these glasses can be rejuvenated by heating (2). The photochemical action produced by the ultra-violet rays can be reversed by heat treatment. The rate of recovery depends upon the temperature to which the glass is heated. These facts are considered as evidence in support of the view that solarization is not a destructive process, but is merely a photochemical change that can be driven in either direction, depending on the quality of the activating rays.

(c) Absorptive properties of the material for ultra-violet radiation

The Bureau of Standards' report (2) concludes that it is to be expected that the solarization will continue as long as any of the chemically active material remains uncombined, this being evident from the fact that after the glass has practically ceased to decrease in transmission, because the activating rays cannot penetrate the entire layer of glass, the solarization is renewed on turning the under (previously unexposed) side of the glass toward the source of radiation.

(d) Source of radiation

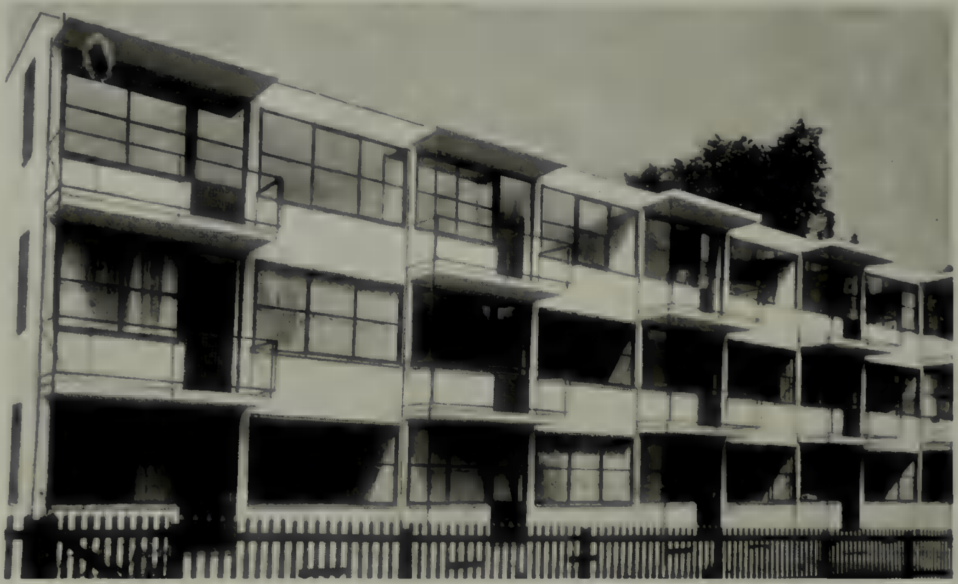
The sources used by the Bureau of Standards (2) in studying solarization were the sun, which does not contain appreciable radiation of wave lengths less than about 295 mμ, the carbon arc (without and with a glass chimney opaque to wave lengths less than 310 mμ) which has a fairly continuous spectrum of ultra-violet radiation, and the mercury arc in which the ultra-violet radiation is confined principally to a number of strong emission bands at 254 to 365 mμ. All of these sources lower the transmission of these glasses, the unfiltered radiation from the artificial sources apparently causing a somewhat greater decrease in transmission than sunlight. The Bureau of Standards suggests (2) that this may be owing to the fact that some of these window glasses solarize but slowly, and may not have attained minimum transmission in the time (one year) allotted for the test. It is concluded however, that whether we solarize these glasses



H. Collischon

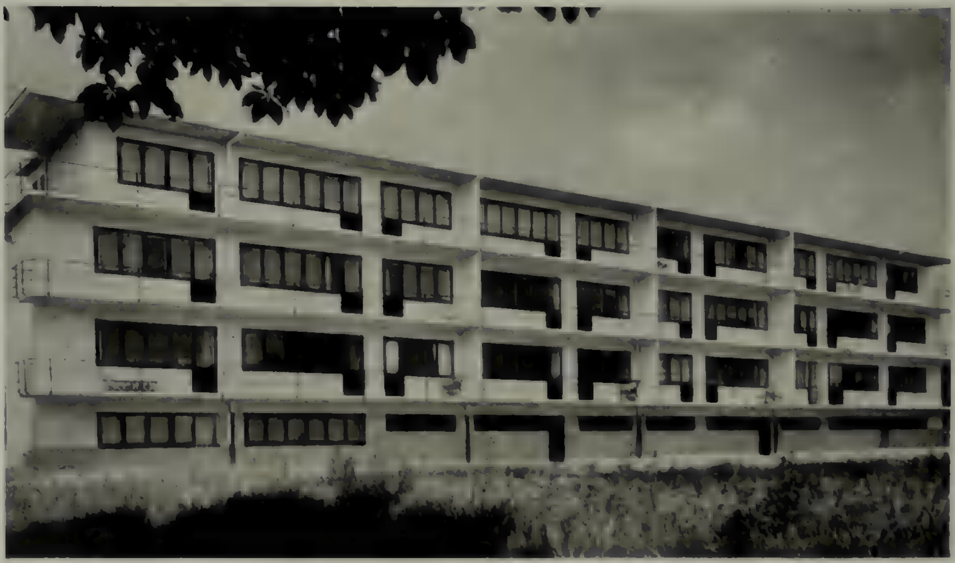
APARTMENT HOUSE, FRANKFURT

FRANZ ROECKLE, ARCHITECT



APARTMENT HOUSE, BASEL

ARTARIA AND SCHMIDT, ARCHITECTS



H. Collischon

APARTMENT HOUSE, FRANKFURT

HERMKES, ARCHITECT

by exposure to the sun or obtain the photochemical stabilization by exposure to an artificial source of radiation (the mercury arc) containing ultra-violet wave lengths not present in sunlight, the same *relative* transmissions are obtained. It was found that the transmission decreased to a constant value which for some glasses is only about one-half the transmission when new. In conclusion it is stated that owing to the slowness of some glasses in coming to photochemical equilibrium on exposure to the sun, it will require several years to determine whether the accelerated test with artificial source of radiation is too severe, but that the outstanding difference in the transmission between the samples of glass subjected to the accelerated test and the duplicate samples of glass which were exposed to the sun is too small to take into consideration, and that, moreover, all the various makes of glass are comparable on the same basis whether by accelerated aging with the mercury arc and the carbon arc or by solarization by exposure to sunlight when the latter is sufficiently prolonged. A "correction factor" is used in determining the minimum transmission for sunlight on the basis of the accelerated tests. Attention is called to the rapid improvement in these new glasses.

BIOLOGICAL VALUE

The antirachitic value of these glasses is a function of:

(*a*) *The transmissibility of the glass.*

(*b*) *A source or locality (in the case of sunlight) having sufficient ultra-violet to prevent rickets.*

In the case of sunlight the minimum transmission permissible will depend upon the altitude and latitude of the given location. Evidently the most transparent glass available will be required in the northern latitudes, where the activating rays are of low intensity, while in locations where sunlight is abundant a glass having a lower transmission factor may prove satisfactory. This conclusion is based upon the report issued by the Council on Physical Therapy of the American Medical Association (3), which shows that only those glasses which had a transmission of 30%, or higher, at 302 mμ gave an appreciable protection against rickets, but that this protection was not 100%.

Reports on the antirachitic efficiency of solar radiation in northern latitudes through various samples of ultra-violet transmitting glasses (4, 5, 6, 7) show that in order to obtain a useful antirachitic effect from sky shine (that is, solar radiation from the sky and clouds) approximately equal to that of the direct rays of the sun, it is necessary to construct a solarium glazed with special glass permeable to ultra-violet radiation and which will admit rays from a large part of the sky; and furthermore (8) that in order to prevent rickets, the animals under test had to be kept directly in the path of the sun's rays if an ordinary window opening glazed with this special glass was used. Those animals that were 1 m. or more from the window, or close to the window, but outside of the path of the sun's rays developed rickets.

The Bureau of Standards report (2) concludes that all evidence available at present indicates that a solarium glazed with special window glass or windows exposed to the direct sunlight are necessary in order to obtain beneficial results in preventing rickets and presumably for general therapeutic purposes, and because of the variability of sunlight, calls the attention to the use of artificial sources, especially the carbon arc and the quartz mercury arc lamp. However, since the shortest ultra-violet rays emitted by these artificial sources of radiation appear to be unsuitable for the activation of foods, etc., it is considered desirable in such cases to cover the arc with a screen which transmits only wave lengths longer than 290 millimicrons; that is to say, the wave lengths which occur in sunlight.

It is evident that further biological research work is needed.

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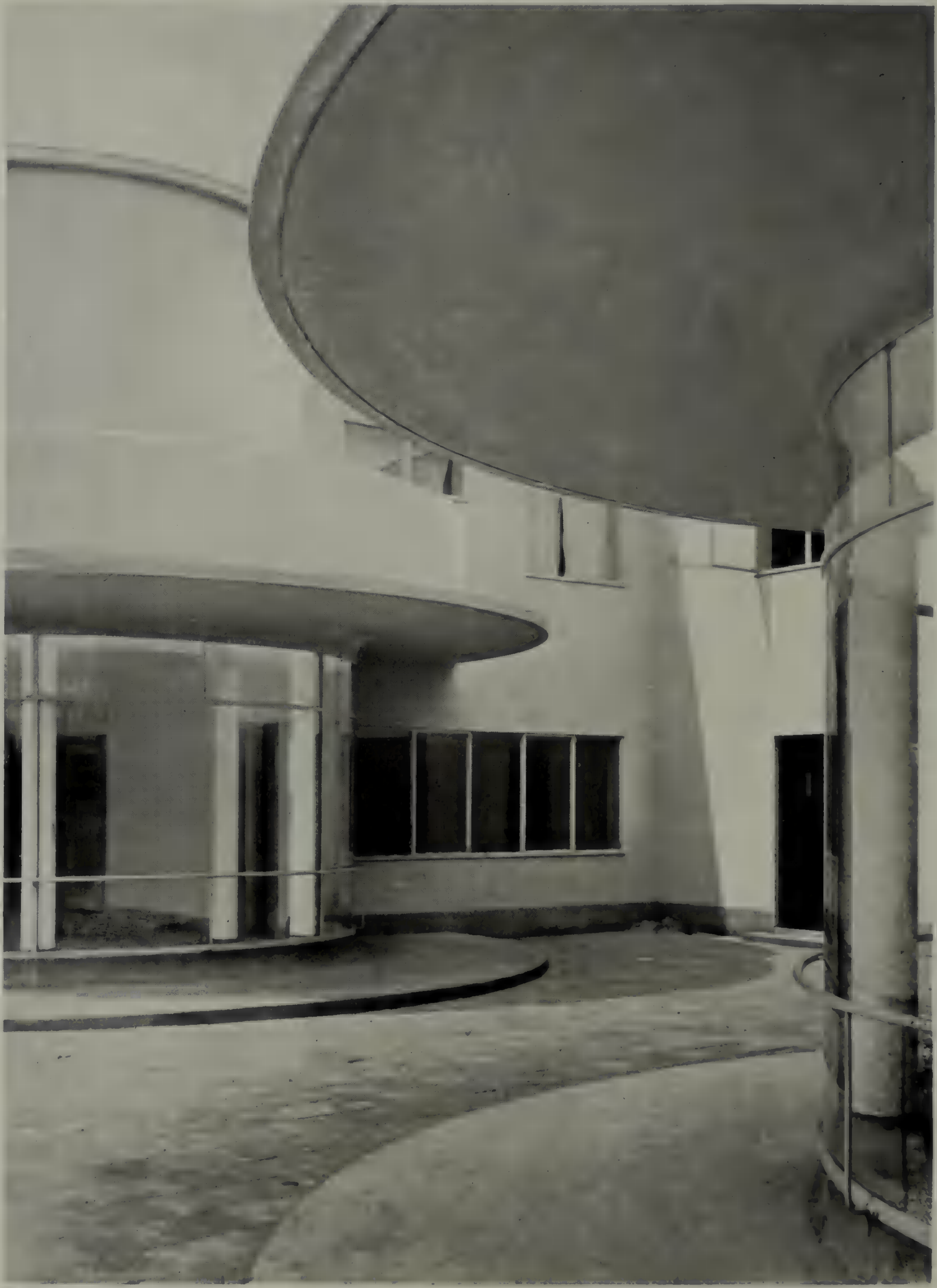


Van Ojen

STORE FRONTS, HOEK VAN HOLLAND, J. J. P. OUD, ARCHITECT

PERMEABILITY TO HEAT

THERMAL CONDUCTIVITY OF MATERIALS

	K
Cinder concrete	2 to 3
Building gypsum	About 3
Plaster	2 to 5
Building brick	3 to 6
Glass	5 to 6
Limestone	4 to 9
Concrete	6 to 9
Sandstone	8 to 16
Marble	14 to 20
Granite	13 to 28

Table 4 (1)

K—Thermal conductivity in Btu. per hour, sq. foot, and temperature gradient of 1 deg. F. per inch thickness. The lower the conductivity, the greater the insulating values.

HEAT TRANSMISSION

The thermal conductivity can be varied with structure and density in the ratio of two to one, the figures running about 0.1% that of silver, 0.3% that of copper, and 1% to 2% that of iron. Although the conductivity of glass is so far below that of the metals, surface conditions are such that heat transfer through a copper condenser is only two and one-half times that through a condenser of *Pyrex* glass (a special borosilicate glass). In specific heat ordinary glass is near aluminum and about twice iron or copper. The low power of reflecting radiated heat is used with advantage in the construction of baking dishes of special borosilicate glass. The high reflecting power of metal slows down the heating of its content to an extent not compensated by its thinness and high conductivity. Although heating takes place more rapidly, yet cooling takes place more slowly in glass than in metal. Glass conducts heat about one hundredth as fast as metal and the greater thickness of the glass dish also impedes cooling.

The insulating value of glass depends upon its thickness as well as upon the thermal conductivity. In general the insulating value, that is the resistance to the heat flow, is equal to the thickness of a material divided by its thermal conductivity, i.e. the reciprocal of the conductance. For thick walls built of insulating materials the rate of heat transmission will be governed mainly by the absolute conductivity of the material itself, the surface finish being of relatively little importance; but for thin walls built of conducting materials the rate of heat transmission will be governed mainly by the surface transfer. Increase in absolute conductivity, reduction in thickness, or acceleration of the outer surface transfer of heat tends to lower the inside surface temperature of the wall.

THERMAL EXPANSIVITY

The change in volume caused by heating or cooling glass is very small, but important in the use of glass for structural purposes. The thermal expansivity can be made to vary in as high a ratio as six to one. Commercial glasses have linear expansivity ranging from three millionths to eleven millionths, these fractions representing the extent to which the length increases or decreases on heating or cooling one degree centigrade. Where ordinary lime glass expands 10 millionths, copper expands 17, iron 12, and platinum 9, this being also the figure for certain lead glasses which are readily sealed to platinum. For special borosilicate glasses (*Pyrex* glasses) the value is around three. Quartz glass, which is amorphous silica, has a linear expansivity of less than one millionth and can be heated and plunged into cold water without breaking.

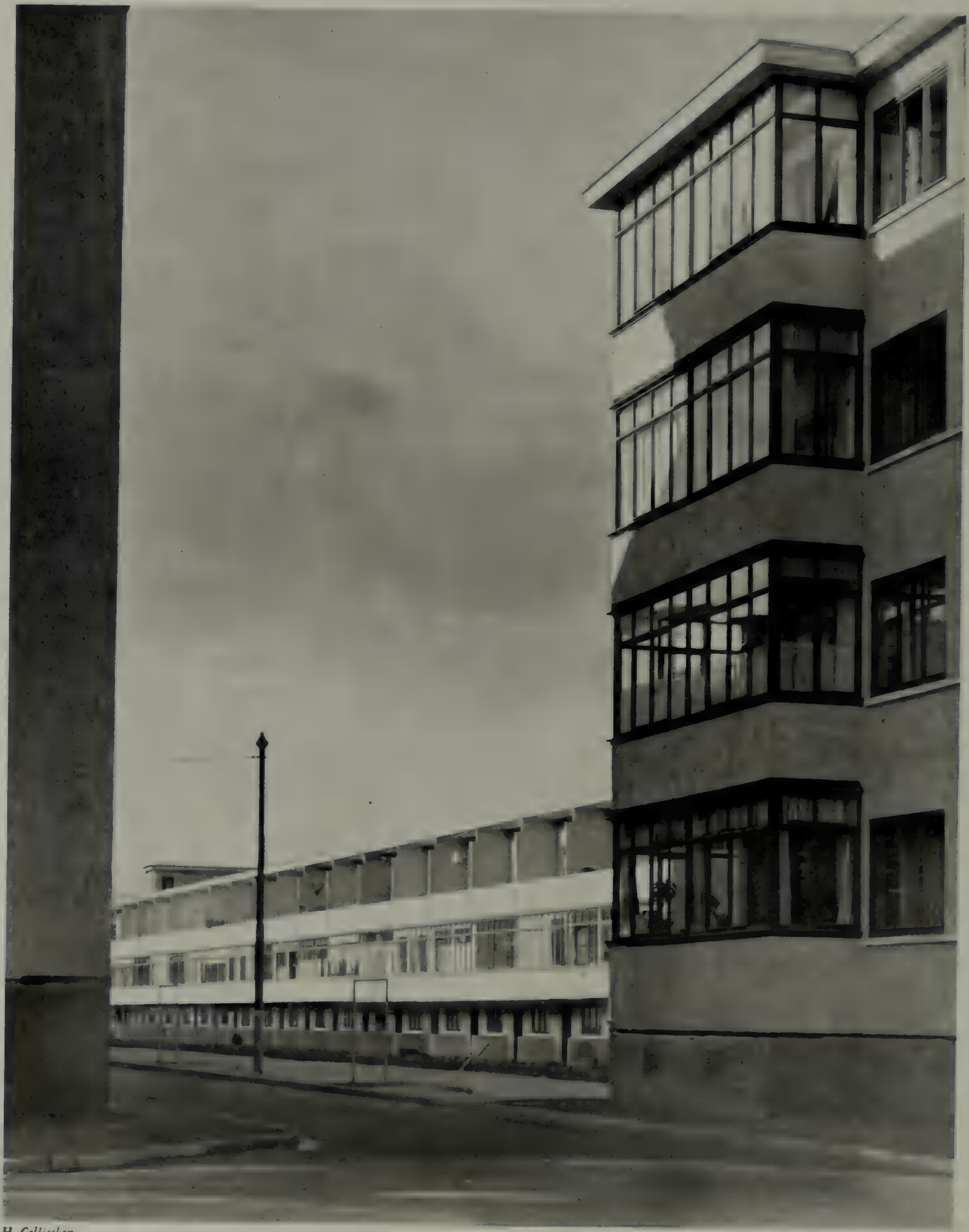
HEAT ABSORPTION

Recent experiments with new glass compositions (2) have demonstrated the possibility of making a heat absorbing glass of low thermal expansion capable of withstanding a considerable heat shock. This heat-resisting, heat-absorbing glass, has been employed in projection apparatus to remove the invisible heat radiation. It is sold under the trade mark AKLO (*Corning Glass Works, Corning, N. Y.*). The desired heat transmission or light transmission, as the case may be, can be secured with a thin piece of a dense glass or a thick piece of a dilute glass. The latter has in general a better light transmission for a given heat transmission than does a thinner piece of a denser glass.

INSULATING VALUE

The heat transfer through a single window is usually more than twice that of a double window (3).

Vacuum panes now being developed in Europe and structural units of vacuum type (up to 90% vacuum) possess the insulating value of vacuum bottles and reduce condensation. Walls and windows of structural glass units eliminate infiltration.



H. Collischon

APARTMENT HOUSE, FRANKFURT, FRANZ ROECKLE, ARCHITECT

FIRE RESISTANT CONSTRUCTIONS

Steel wire netting incorporated in glass of 1/4″ thickness and over afford fire protection (resistance to passage of flames and the cooling and impact of fire streams) by holding the glass in the sash after it has been cracked from the heat. The degree of protection furnished by a wired glass window is naturally limited to the fusing point of the glass. Fire records show, however, that under ordinary conditions where the exposure is not especially severe such windows are effective fire stops (4). One-quarter inch wired glass for fire protection must not exceed 720 sq. in. exposed area or 54″ vertical and 48″ horizontal dimensions to conform to the rules of the National Board of Fire Underwriters. (Class E openings.)

Constructions of glass prisms placed in metal frames or reinforced concrete frames with an elastic compound to allow for expansion and walls of reinforced glass blocks are effective fire stops. Fireproof glass windows, walls and partitions used in Europe ("Luxfer" Electro and "Solfac" Galvano glass) consist of 10 x 10 cm. prismatic crystal glasses fastened electrolytically in copper frames. The profile and strength of the frame depends on the type of glass used. Great areas are divided by metal or reinforced concrete frames. Expansion joints are provided when the glass is placed in the frames. These constructions can also be used for roof lights.

Courtesy Truscon Steel Co.

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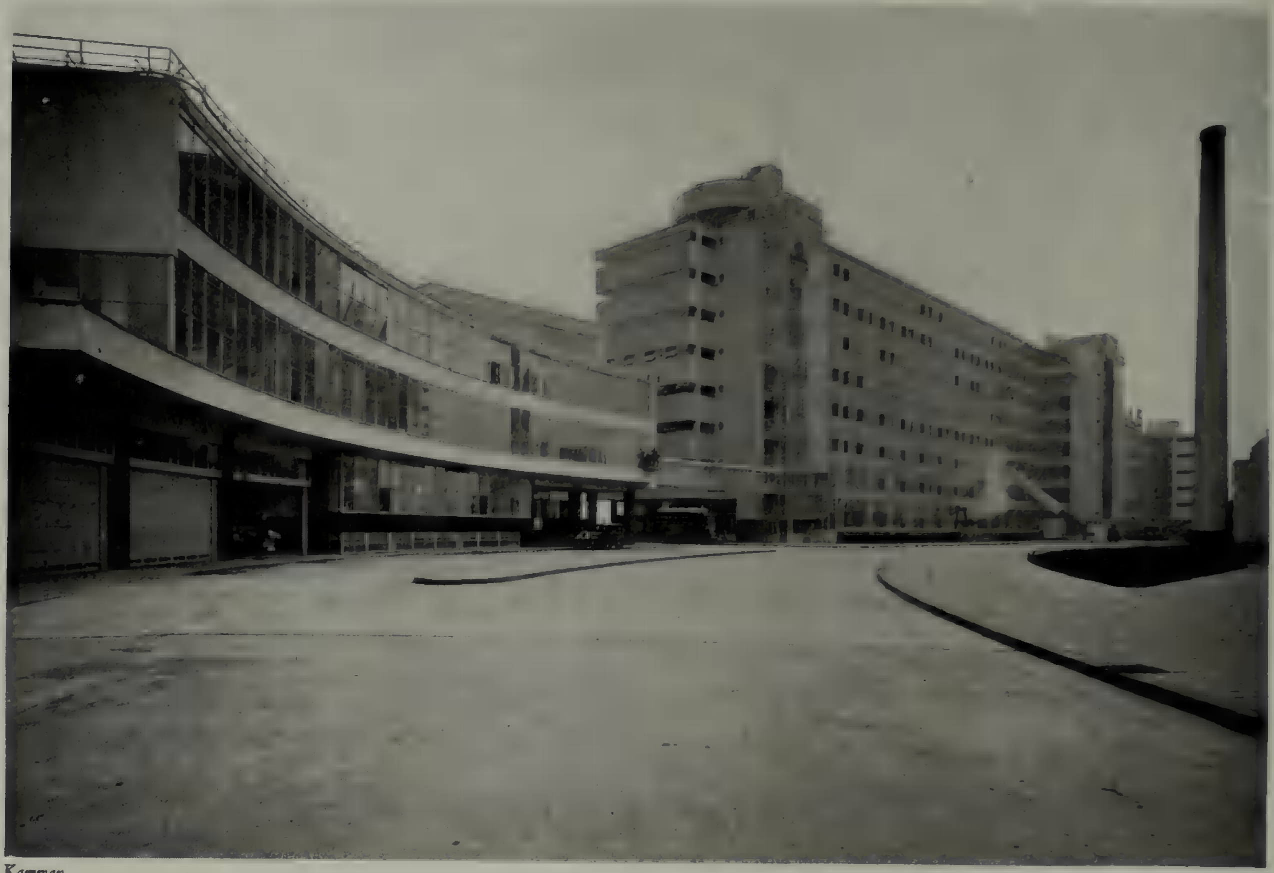
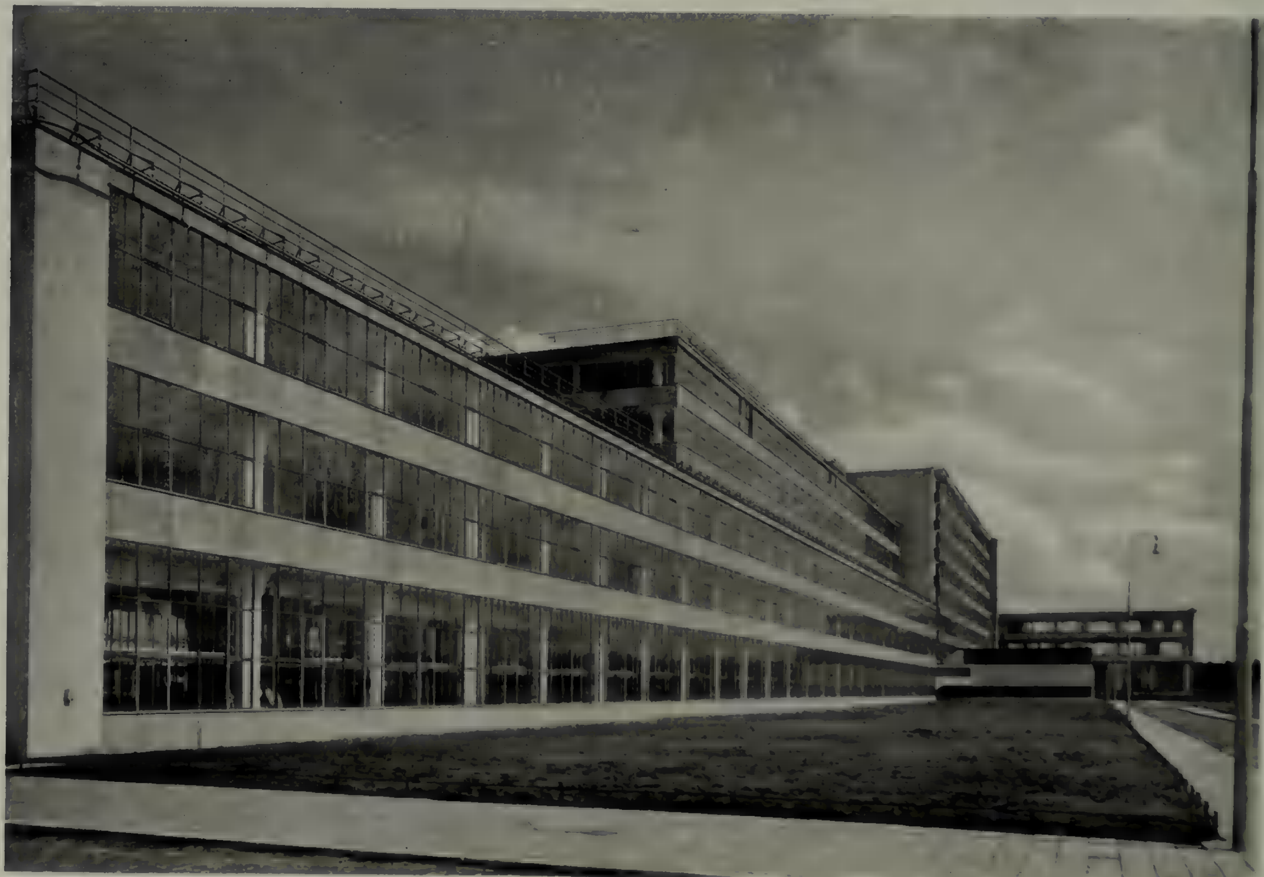
Courtesy Truscon Steel Co.

SLIDING STEEL HANGAR DOORS



Kamman



VAN NELLE TOBACCO FACTORY, ROTTERDAM, BRINKMAN AND VAN DER VLUGT, ARCHITECTS

ACOUSTICAL PROPERTIES*

1. ABSORPTION OF SOUND

As an absorbent of sound, glass is among the lowest rated materials, due to its smooth surface. The value of its absorption is generally taken at 1½% as compared with 3% for hard gypsum plaster on metal lath and 6% for lime plaster on wooden lath. In very large sheets it would undoubtedly vibrate as a diaphragm under the impact of sound and would have absorption values in excess of 1½% at various frequencies, corresponding to its natural period of vibration and various harmonics thereof. Values on the sound absorption coefficient of glass vary with different authorities. The value 0.027 at 512 cycles has been secured by both W. C. Sabine and F. R. Watson. Results at other frequencies are unobtainable. The Bureau of Standards gives the following values of absorption coefficient of glass: 0.021 at 297 cycles; 0.020 at 1095 cycles; and 0.010 at 2190 cycles. The Bureau of Standards apparently accepts and uses the value of 0.027 at 512 cycles.

2. TRANSMISSION OF SOUND

Paul E. Sabine, J.A.S.A., January, 1930 (1):

"A door or window may be treated as a single structural unit, and the tests on these constructions show that the reduction factors are determined for the greater part by the weight of such units and also, but to a less degree, by their structural stiffness. Table 5 gives the averaged results for 16 different units (Editor's note: only seven units employing glass are shown). Unless otherwise indicated the units were sealed in tightly in each case so that the values are somewhat higher than would be the case in actual practice, when the sound insulation is decreased by the passage of sound through the cracks at the threshold and sides.

No.	Description	Av. Reduction (db.)	
		128 to 4096	128 to 1024
10	Window, one pane 79"x30", ¼" plate glass	23.0	22.8
11	Window, 4 panes each 15"x39", ¼" plate glass	25.7	25.3
12	Window, 2 panes each 31"x39", 3/16" plate glass	20.1	19.7
13	Same as 12, but double-glazed with glass set in putty on both sides of sash, 1" separation	23.4	23.1
14	Same as No. 13 but with glass set in felt	25.4	24.0
15	Small 3/16" leaded panes	25.0	23.9
16	12 panes 10"x19", ⅛" window glass	21.7	21.2

Table 5. (*Table 1 of P. E. Sabine*).

Reduction factors for single glass panes (1).

"Inspection of the values for the windows suggests that the crossbracing of the sash effects a slight increase in insulation over that afforded by larger unbraced areas of glass. On the whole, it may be said that normal door and window construction can not be expected to give a reduction of more than 25 db."

The above values for the average reduction factors were the averages for a number of standard test tones which included four tones in each octave below 1024 cycles per second, and two tones in each of the two octaves above this frequency, or seventeen tones in all.

In addition to the above data on single thicknesses of glass, the following information on double thicknesses of glass with various air separations are also quoted from the same article by Paul E. Sabine (1).

"This series of tests was conducted with two single-pane ¼" plate glass window, 82" x 34" set in one of the Sound Chamber openings. Spacing frames of 1" poplar, to which ½" saddler's felt was cemented, were used to separate the two windows.

"The separation between the windows was increased by increasing the number of spacing frames. It is evident that the experiments did not show the effect of increased air space alone, since a part of the transfer of sound energy is by way of the connection at the edges. However, the results presented in Table 6 show that the spatial separation between double walls does produce a very appreciable effect in increasing sound insulation."

No.	Description	Reduction (db)	Equiv. Masonry
48	Sashes in contact	29.3	1.8"
49	1½" separation	34.0	2.6"
50	4½" separation	35.3	3.0"
51	7½" separation	38.2	4.1"
52	9½" separation	40.7	4.8"
53	13½" separation	42.5	5.5"
54	16" separation	43.0	5.8"

Table 6.

Reduction factors for double glass panes (1).

Transmission of acoustic energy by partitions of wood, glass, steel or masonry, which are impervious, must take place by means of minute vibrations of these structures set up by the alternating pressure of the incident sound. Sound, considered as undulatory motion of the air particles, cannot pass through such barriers. If the natural frequency of the partition is much lower than the frequency of the incident sound, the transmission depends chiefly on the mass of the partition. If the natural frequency is much higher than that of the incident sound, the transmission depends on the stiffness of the partition.

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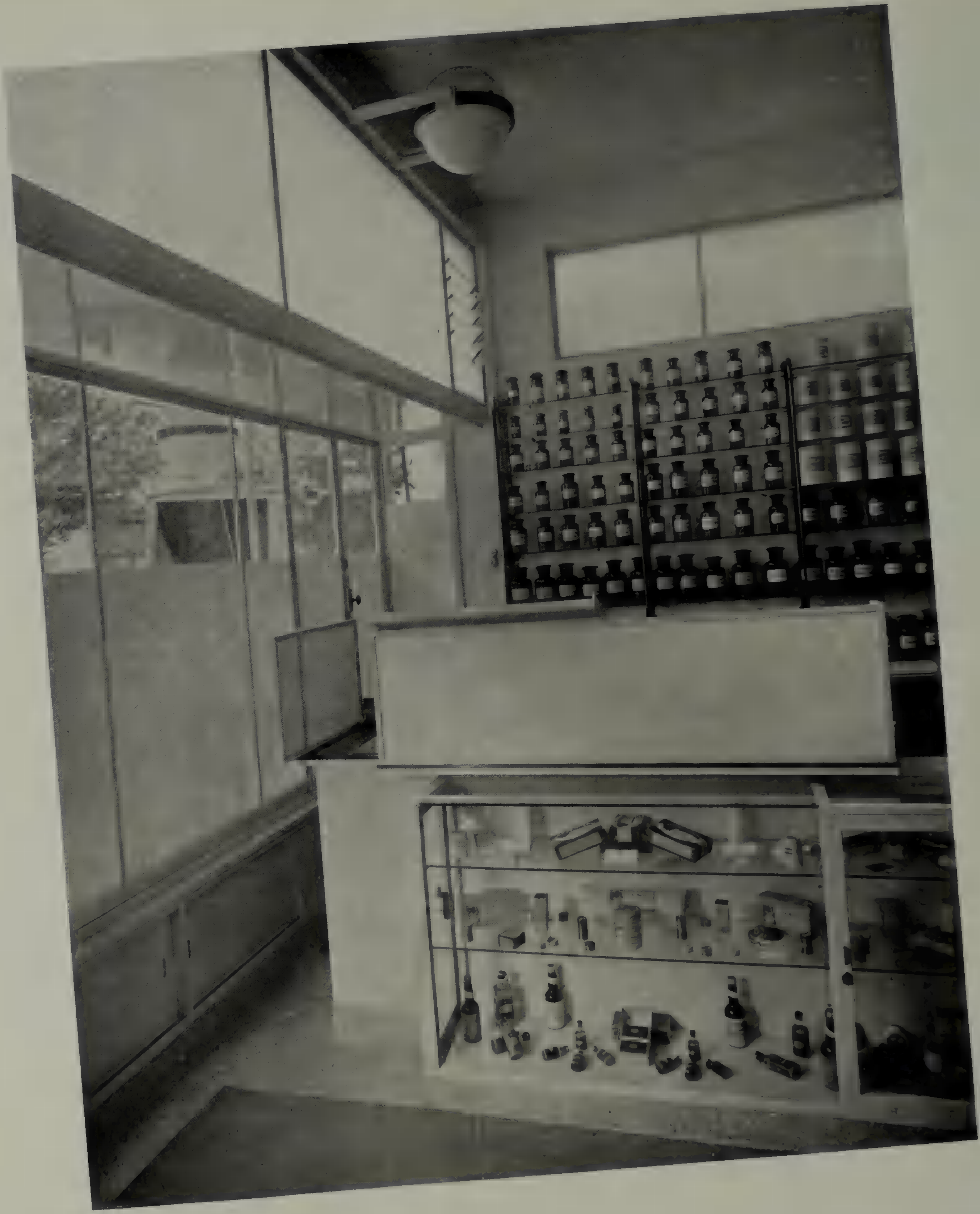
* Compiled for The Architectural Record by G. T. Stanton, Asst. Acoustic Engineer, Electrical Research Products, Inc., New York.



Eilers

DISPENSARY, J. DUIKER, ARCHITECT, HOLLAND

Quoting from F. R. Watson's "Acoustics of Buildngs", 1930 (2):

"Experience has shown the following in connection with sound reduction:

"With an average reduction factor of 25 db., normal peech can be understood quite easily and distinctly hrough the partition.

"With an average reduction factor of 30 db., loud peech can be understood fairly well if conditions are quiet.

"With an average reduction factor of 35 db., loud peech is audible, but not easily intelligible under quiet conditions.

"With an average reduction factor of 40 db., normal peech is not audible, loud speech can be faintly heard, but not easily understood, and for all practical purposes the partition can be considered as 'sound proof'.

"Flexural vibrations play an important part in transmission. Dead air spaces between double windows were not as effective as commonly supposed. The air space should not be bridged over by solid materials even at the edges of the glass. Inserting sound absorber between the glass plates increased the insulation." The results obtained by the Bureau of Standards on transmission tests through glass are quite similar to those obtained by Paul A. Sabine.

No information as to the relative reduction factors of the glazing method used in the monitoring booths of the various film studios could be obtained. This method uses different thicknesses of glass with a constant spatial separation, and is said to be more satisfactory than using glass of the same thickness at the same spacing. This point would appear to be reasonable if the theory of transmission in such impervious structures is correct by providing a mismatch of the air impedance in the various sections. This condition, however, would only be true in the event of true diaphragm action of the glass windows. The presence of diaphragm action is evidenced in Table 5 of Paul E. Sabine, since with small sections of glass rigidly braced greater reduction factors were obtained.

It is to be appreciated that reduction factors as indicated for double windows were not generally the obtainable in practice, since the conditions of the tests were commercially unobtainable. In this particular test, there was no connection between the windows by way of the sashes or surrounding masonry structures since two completely isolated rooms were used.

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HALLWAYS, ADMINISTRATION BUILDING, DESSAU, WALTER GROPIUS, ARCHITECT

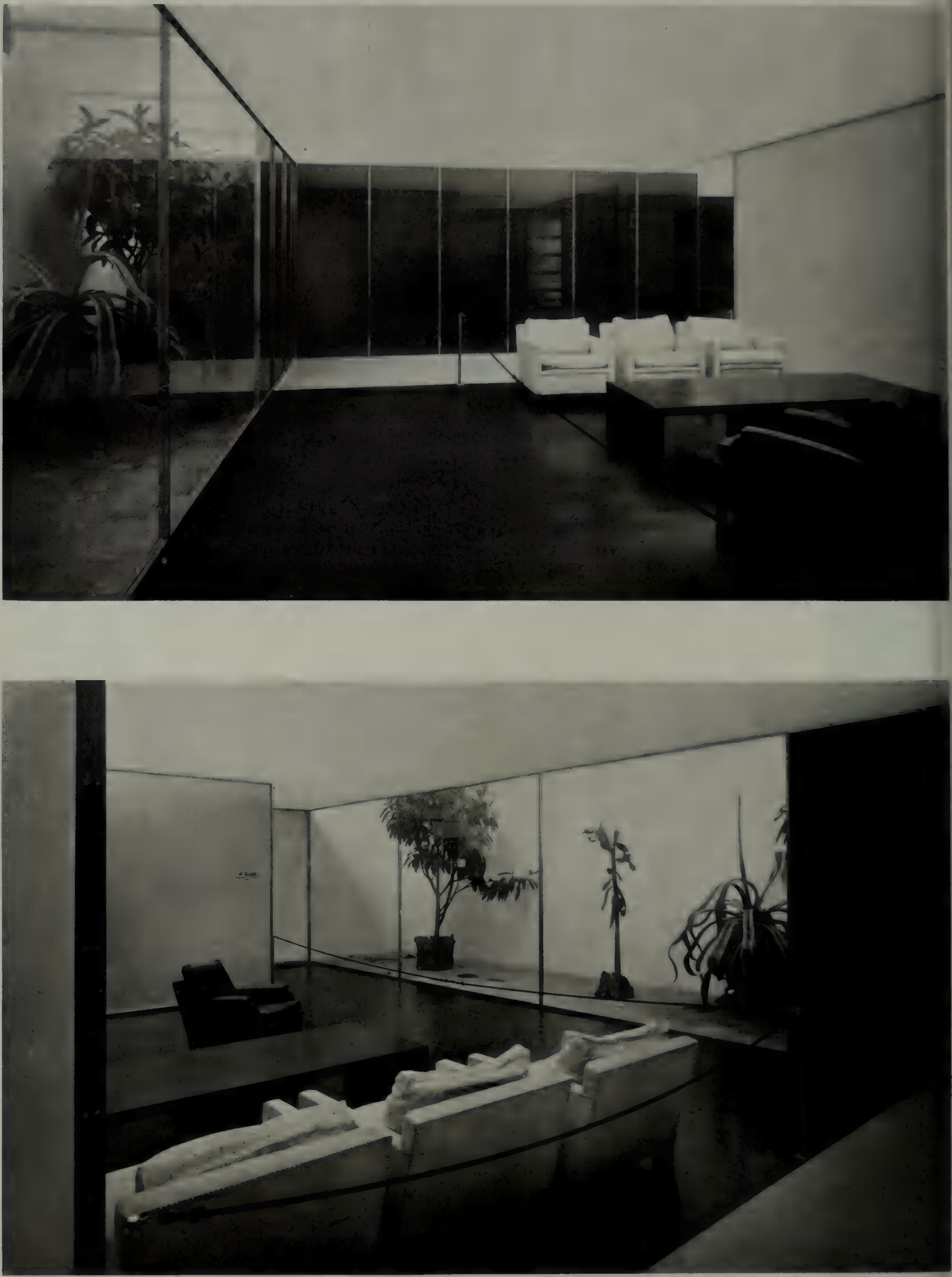

PLATE GLASS PARTITIONS, EXPOSITION STUTTGART, MIES VAN DER ROHE, ARCHITECT

MIES VAN DER ROHE, ARCHITECT

PERMEABILITY TO FLUIDS

The surface of glass is non-porous, does not crack, absorbs no odors, and is impervious to air, gases, water, grease and most acids. Glass will not warp, swell, pull apart or lose its hardness when exposed to moisture. A polished surface will not disintegrate and will retain its luster; it is difficult to mark or write on, and is particularly easy to keep clean. For these reasons clear or colored glass polished or modeled in sheets or in tiles of sufficient structural strength can be used extensively for exterior and interior wall treatment, partitions, toilet stalls, shopfronts, floors, ceilings, mirrors, furniture, signs and lighting equipment. Glass will furthermore meet the criteria for a number of building fixtures.

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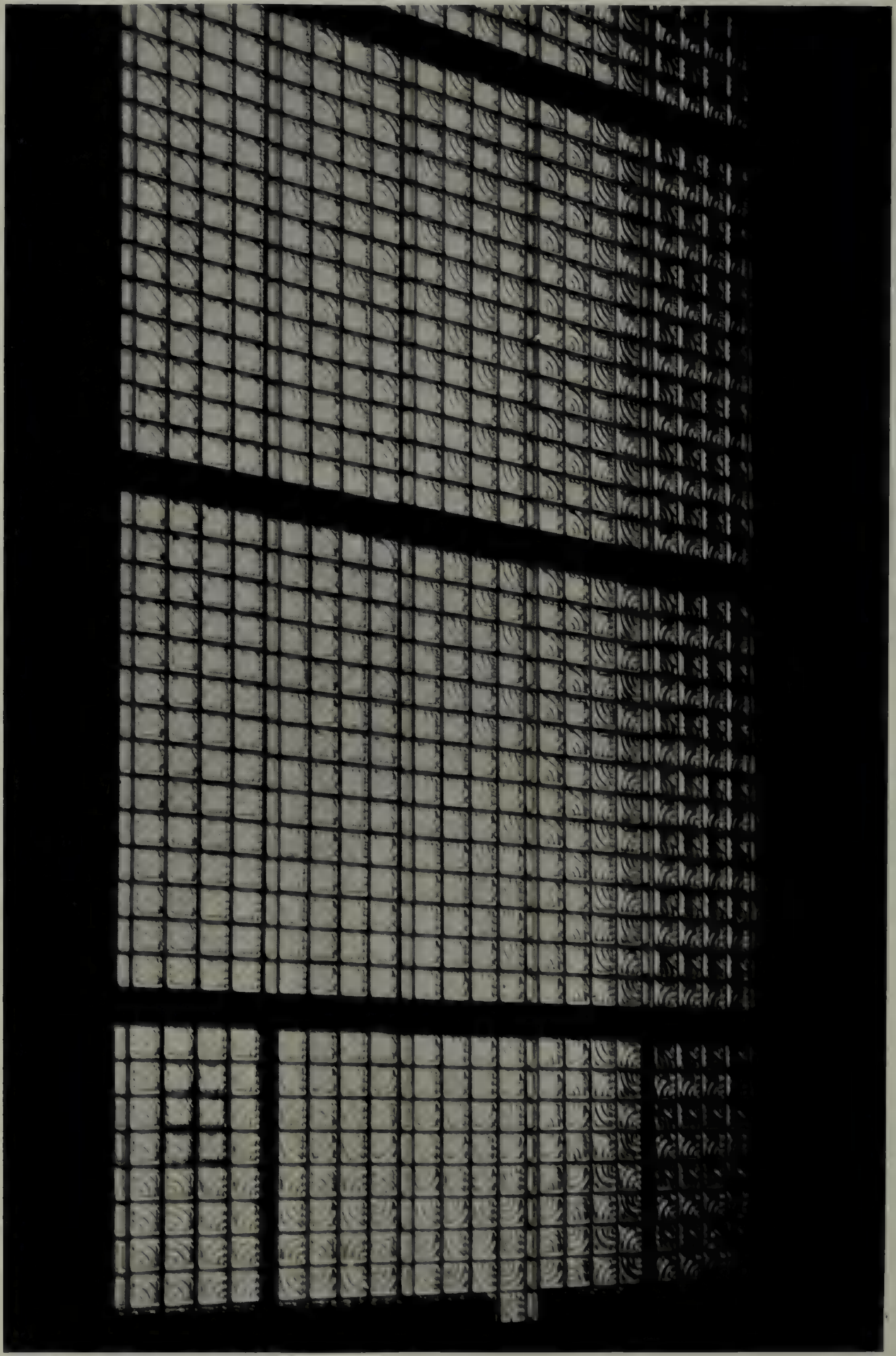


Courtesy F. L. Keppler, Relief Glass Construction, N. Y.

PRISM WINDOW

MECHANICAL PROPERTIES

The mechanical properties depend on composition and dimensions. The specific gravity or density of ordinary lime glass, 2.5, is close to that of metallic aluminum, 2.6. It can be made to vary in a ratio of about three to one, namely from 6.33 to 2.14. The weight of ordinary glass is roughly 2 lbs. for each ⅛'' of thickness.

The hardness of glass, that is, its imperviousness to scratching, can be made to vary in about a two-to-one ratio, the hardest being harder than quartz.

The tensile strength of glass in laboratory measurements ordinarily is about 10.000 lbs. per sq. inch. It is possible to prepare glasses by special heat treatment, the so-called case-hardening process, of tensile strength near that of wrought iron, which is about 50.000 lbs. per sq. inch. The compression strength of glass is greater than that of ordinary structural materials such as granite, concrete or brick. Glass can be worked and shaped and polished to a brilliant surface.

The common causes for fracture are compression, tension, flexure, impact and sudden temperature differences causing internal stresses. Ordinary sheet and plate glass should not be subjected to structural strains; edges in contact with other materials should therefore be cushioned.

Fire-resistant constructions (see PERMEABILITY TO HEAT).

Wired glass

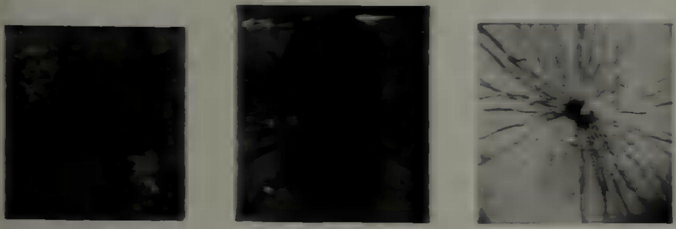
Wired glass has about 1½ times the bending strength as glass of same thickness not wired. The wired-mesh reinforcing causes a loss in light transmission.

Corrugated glass

Corrugated glass, wired or clear, has a higher bending strength than flat glass.

Laminated safety glasses

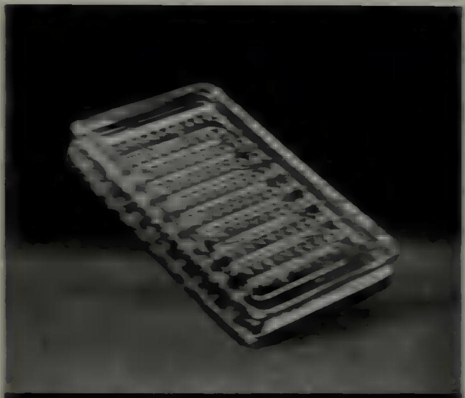
These glasses consist of two or three thicknesses of plate or drawn sheet glass with one or two layers of a transparent pyroxylin plastic between. The layers are welded into a single piece under heat and great pressure. The adhesion between the glass and the



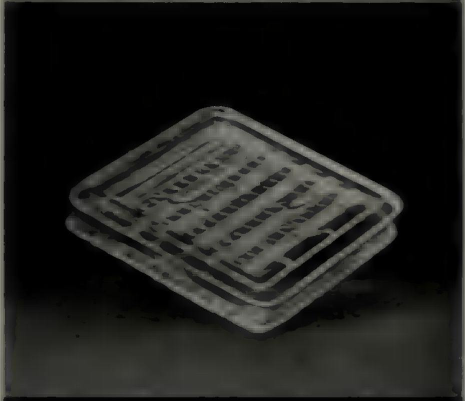
Courtesy American Window Glass Co.

FIG. 13.

THE LAMINATED GLASS IS CRACKED BY THE ROD AND BY THE IMPACT OF THE STEEL BALL BUT DOES NOT SCATTER

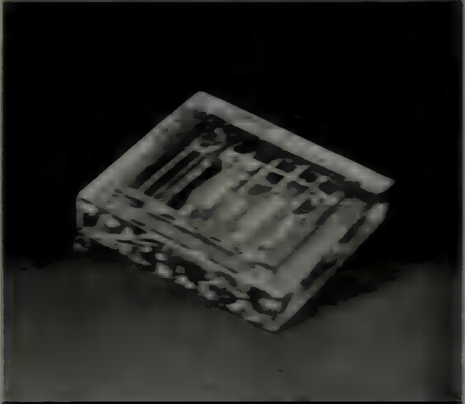


PRISM
6⅜'' x 10¼'' x 1''

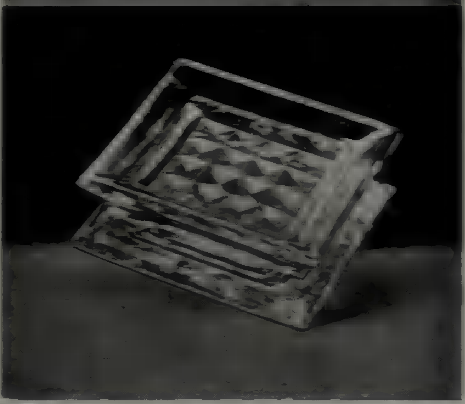


PRISM
6⅜'' x 6⅜'' x 1''

PRISM
8¼'' x 8¼'' x 1''

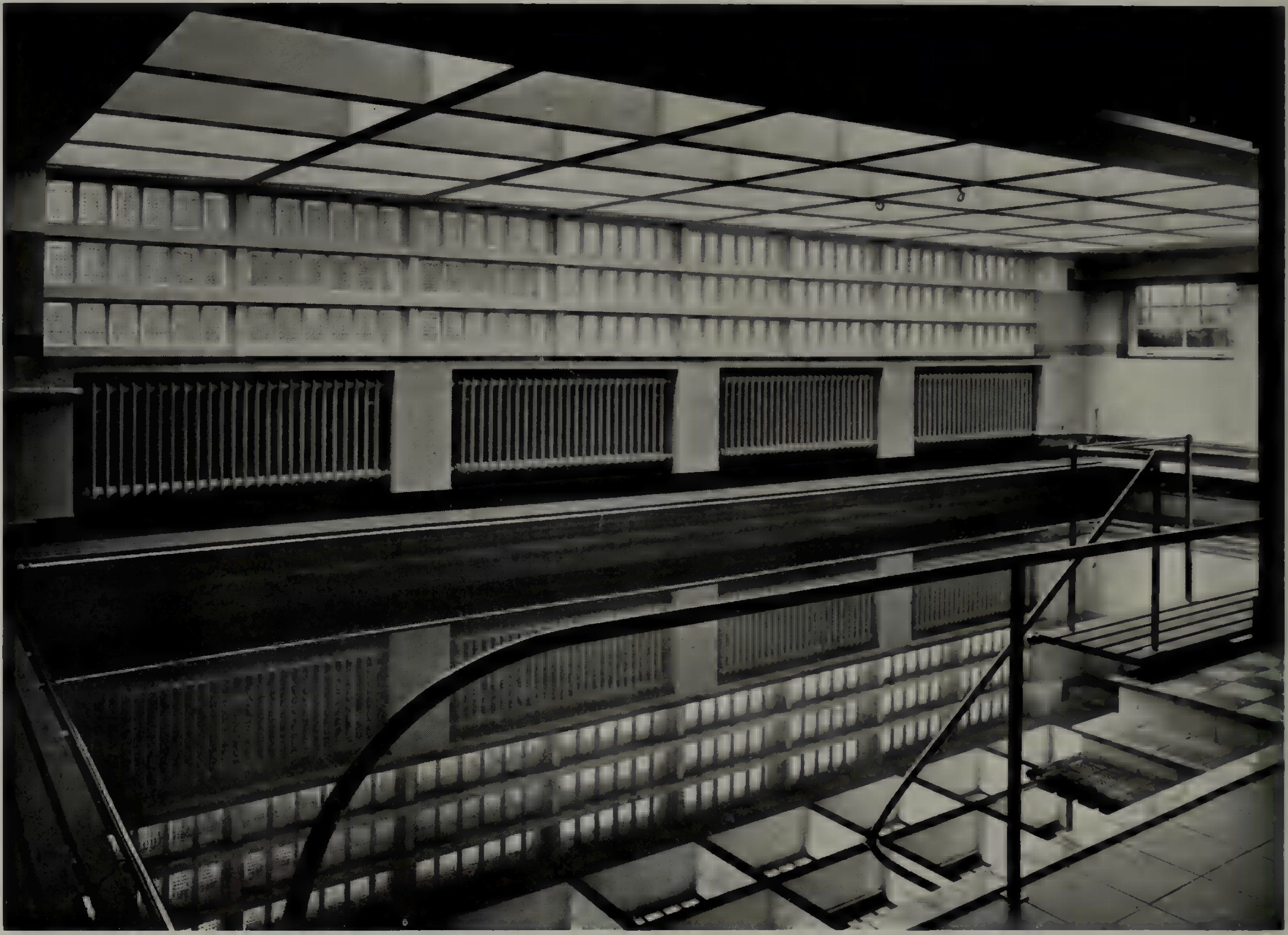


PRISM
4⅞'' x 4⅞'' x 1''

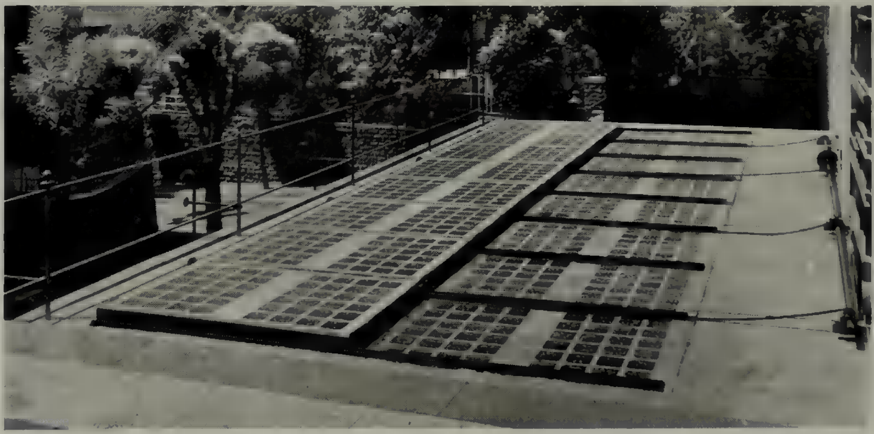


TILE
6'' x 6'' x 2''

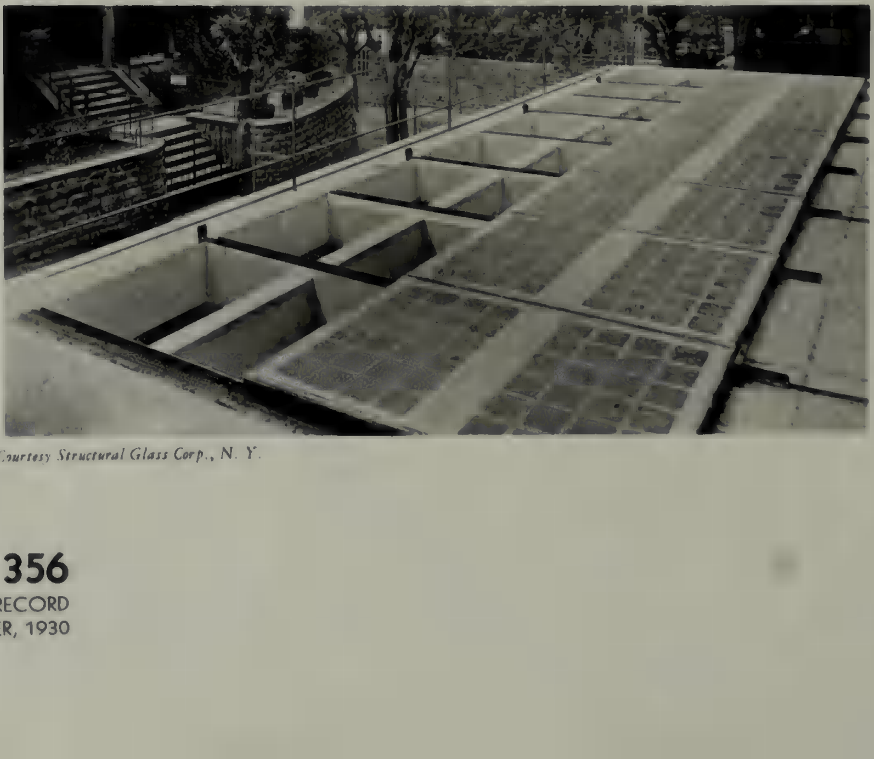
Courtesy Structural Glass Corp., New York



Courtesy Structural Glass Corp., N. Y.



Courtesy Structural Glass Corp., N. Y.



Courtesy Structural Glass Corp., N. Y.

SWIMMING POOL WITH SLIDING ROOF

plastic is so complete that the glass will not separate from the plastic when it is broken. (Fig. 13). In its finished form this glass can be cut only with special tools. Laminated glass does not impair visibility. It is manufactured in various thicknesses, from light scatter-proof glass to heavy 1" thick bullet-proof glass.

Prismatic units

The combination of glass prisms and slender reinforced concrete ribs makes the glass an integral part of the construction. All metal members are imbedded in concrete, and there is no risk of corrosion. The panels seldom exceed 35 to 40 square feet; they can be made in the plant or built on the job. Expansion joints should be provided around the panels. The design of the prisms should insure a minimum loss in light transmission (Fig. 14), a minimum strain on the flanges, and easy exchange of broken units. Ventilation units in bronze frames can be placed in these constructions. In addition to light-transmitting properties, these relatively light constructions usually are fire-proof and sound-proof. Heat-insulating value varies; air infiltration is eliminated. Maintenance cost is minimal.

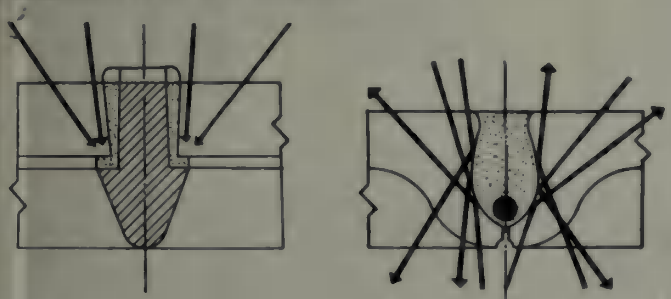


FIG. 14.

THE CONSTRUCTION AT RIGHT TRANSMITS PART OF THE LIGHT WHICH IS STOPPED BY THE METAL MUNTIN IN THE CONSTRUCTION AT LEFT.

Glass bricks

Panels of hollow, vacuum or solid glass bricks or blocks of various compositions and colors are constructed without reinforcing members. The glass is clear or wired. The bricks are laid in cement-mortar with lime added for pliability. The hollow bricks should be designed to insure a minimum loss in light transmission in the hollow or through reflection. Broken units should be exchangeable. The panel sizes average the sizes given above. Reinforced blocks have high fire-resisting qualities. The cost of these panel constructions (prisms and blocks) varies with the type of glass from $2.30 to $3.40 per square foot installed.

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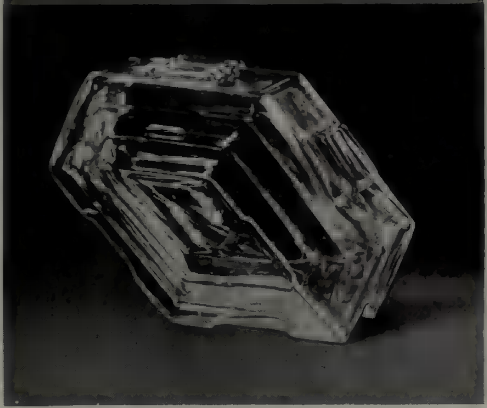
SOLID BRICK
10" x 5" x 2½"

HOLLOW
BLOCK
9¼" x 4½" x 3"

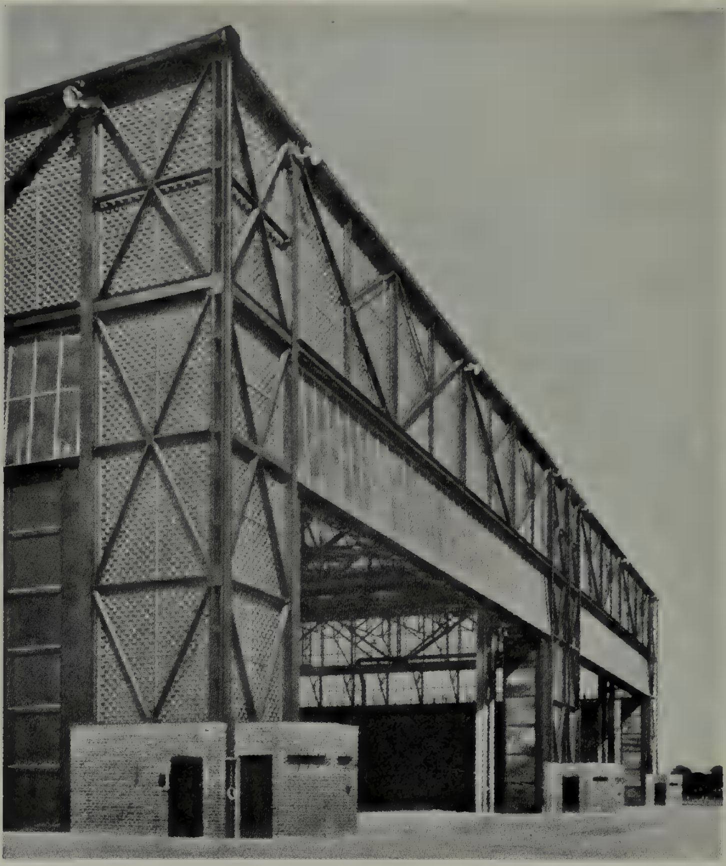
HOLLOW
BLOCK
9½" x 4½" x 3"

VACUUM
BLOCK
9¾" x 5" x 2½"



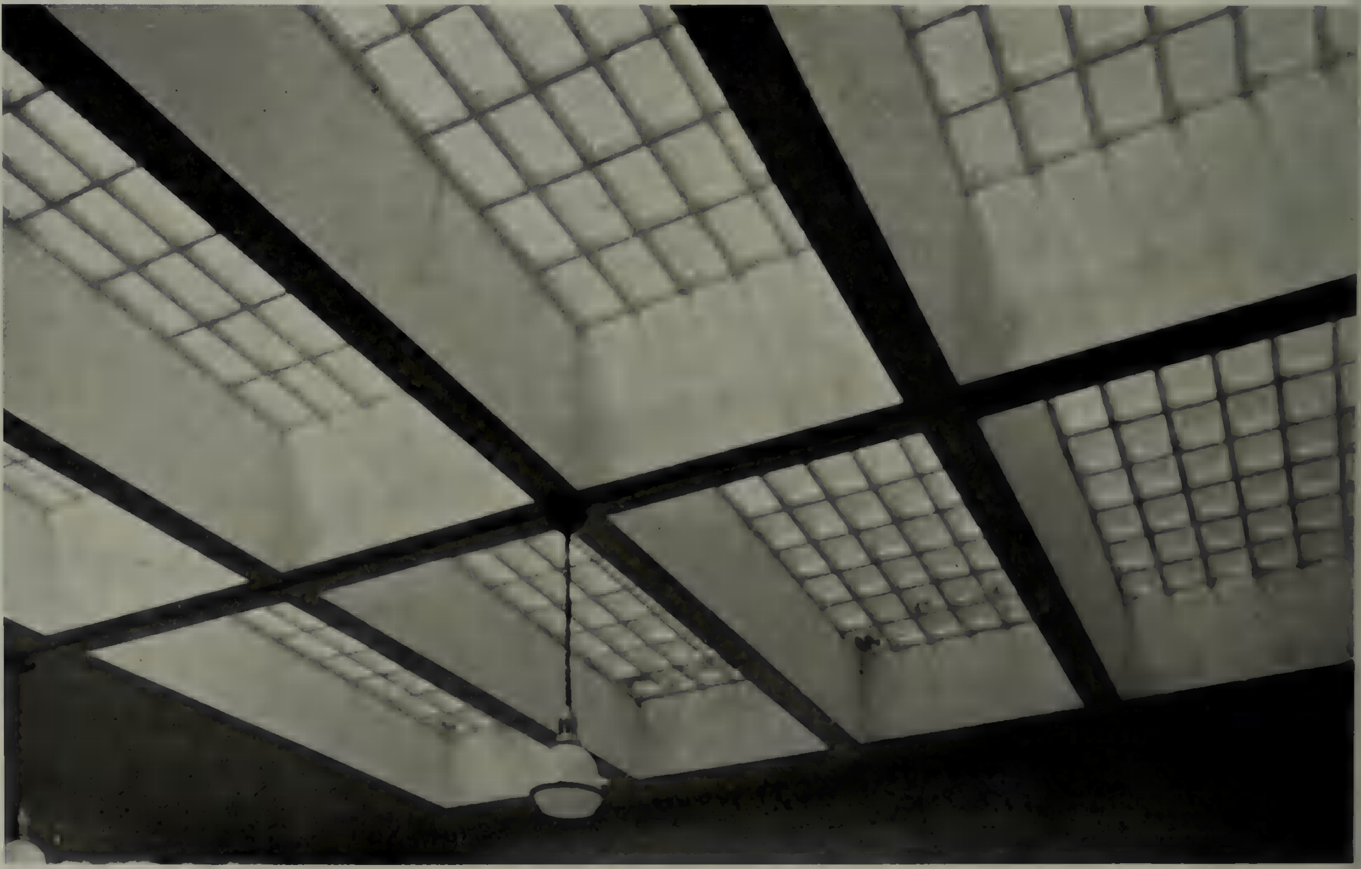
VACUUM
BLOCK
7¾" x 5½" x 3"

Courtesy Structural Glass Corp., N. Y.



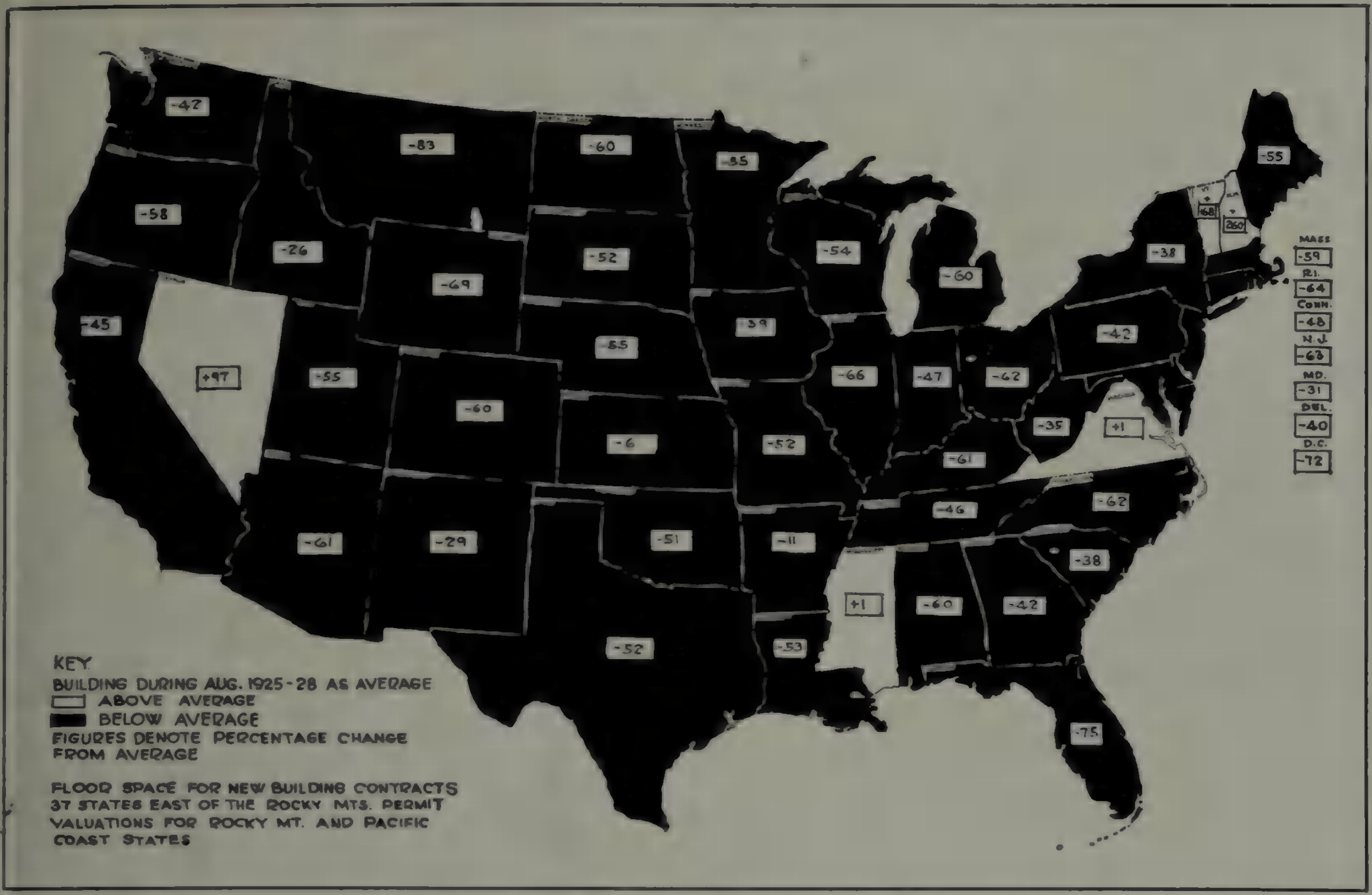
Der Baumeister

GLASS BLOCK WALLS, AIRPLANE HANGAR, MUNICH
K. J. MOSSNER ARCHITECT



Courtesy Structural Glass Corp., N. Y.

ROOF LIGHTS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KEY
BUILDING DURING AUG. 1925-28 AS AVERAGE
▭ ABOVE AVERAGE
■ BELOW AVERAGE
FIGURES DENOTE PERCENTAGE CHANGE FROM AVERAGE
FLOOR SPACE FOR NEW BUILDING CONTRACTS 37 STATES EAST OF THE ROCKY MTS. PERMIT VALUATIONS FOR ROCKY MT. AND PACIFIC COAST STATES

The volume of building for August, 1930, showed only five states where current new volume was greater than average (August, 1925-1928): New Hampshire, Vermont, Virginia, Mississippi and Nevada. Of these Virginia and Nevada consolidated their July gains. Other states showing gains in July failed to carry through in August.

BUILDING TRENDS AND OUTLOOK

PROSPECTS FOR NON-RESIDENTIAL CONSTRUCTION

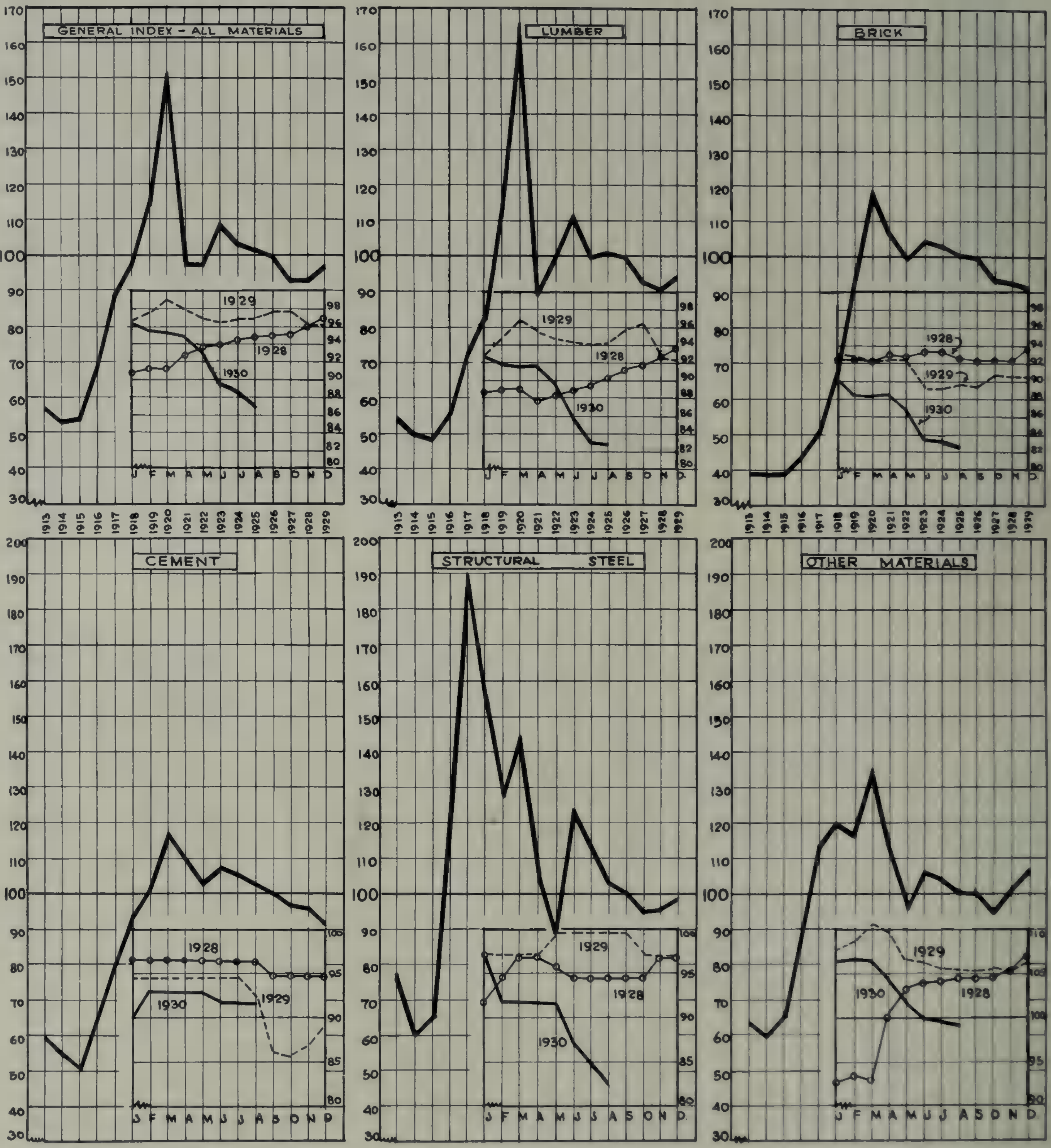
Non-residential building is normally a concomitant and not an important moving cause of large general construction activity. Nor is non-residential building a maker of business prosperity. It is rather a symptom or a result. This is especially true with respect to industrial building which usually accounts for about one-fourth of all non-residential building. In each of the four years of relatively large industrial activity since the war (1920, 1923, 1926 and 1929) this type of construction accounted for more than 25 per cent of the total, ranging from almost 42 per cent in the hectic year, 1920, down to 26½ per cent for 1929. In the recent depression years (1921, 1924, and 1927) industrial building ranged from 19½ per cent of the total in 1924 to only 17 per cent in 1921. It is here of large importance to note that new industrial construction has been, in the past, most often undertaken at or near the crest of large industrial activity, even in the face of our much vaunted improvement in industrial management.

To somewhat the same extent what is true for industrial building has held for commercial building, which usually accounts for more than one-third of all non-residential building. Commercial building, however, has been more readily activated by economic conditions and factors of obsolescence than has industrial building. Together these two branches of non-residential construction, for the years from 1919 through 1929, have accounted for about 60 per cent of all non-residential building; the remainder included educational buildings, hospitals and institutions, public buildings, religious and memorial, and social and recreational structures. Of these, educational buildings have been of most importance, and public buildings of least importance. New educational buildings undertaken in the last eleven years have represented 17 per cent of all non-residential building while public buildings have accounted for only about 3 per cent of the total.

(*Continued* ■ *page 92, Advertising Section.*)

WHOLESALE PRICES FOR BUILDING MATERIALS

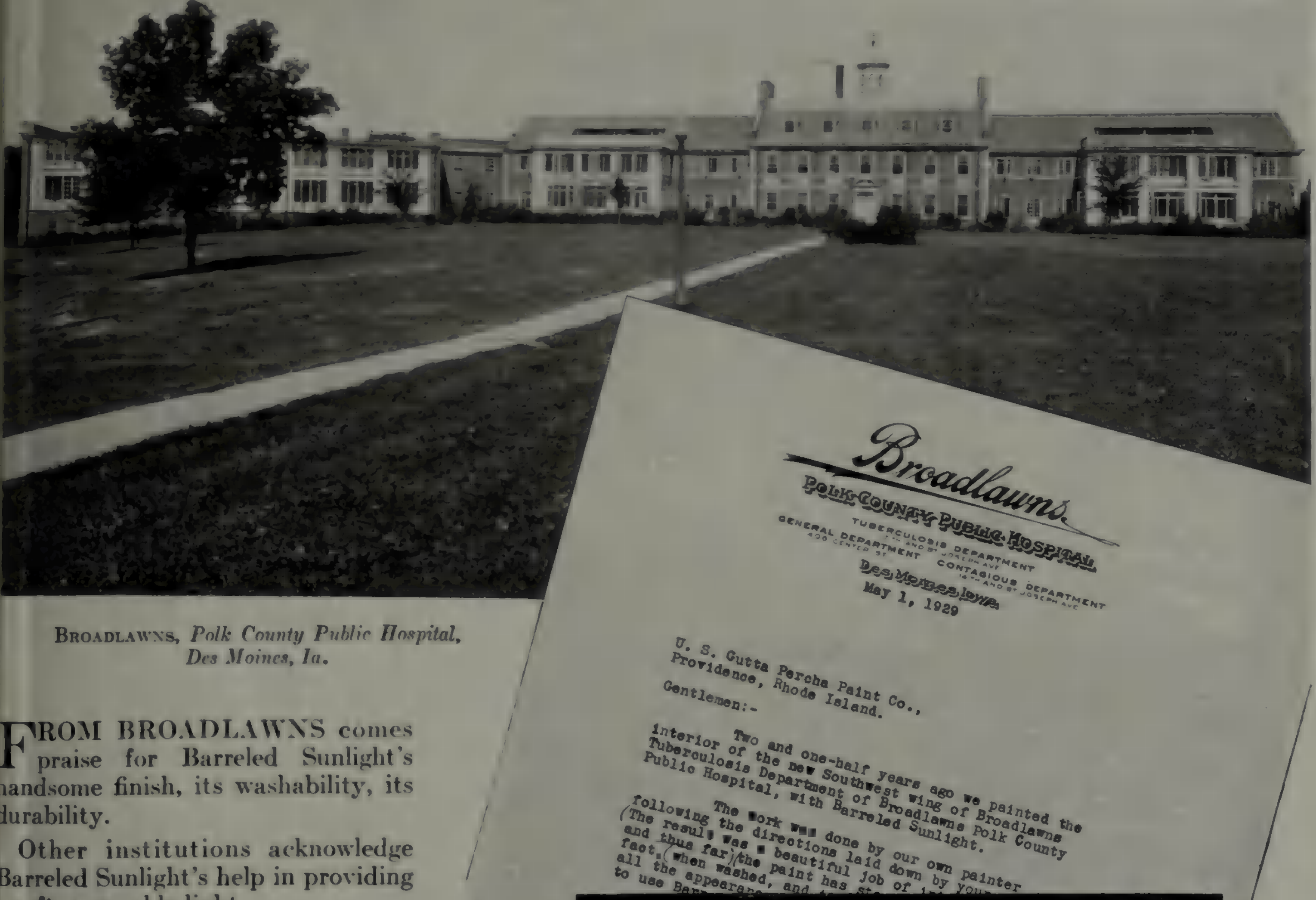
(1926 monthly average=100)



Data from U.S. Dep't of Labor

The general index of building material prices continued its downward trend through August and the early weeks of September while the general commodity index showed some signs of strength, almost entirely due to higher prices for farm products and foods and largely reflective of the effects of the recent drought. Despite these opposite trends prices for building materials were still on a higher plane than general prices, a condition which has lasted for almost two years, in the face of a drastic curtailment in building. There are evidences that discounts under existing union scales in the building trades have been accepted in certain localities; while increased efficiency on the part of building tradesmen, usually manifested in times of slack employment, has operated to produce measurably lower unit construction costs.

Can you *say as much* for the paint you specify?



Broadlawns
POLK COUNTY PUBLIC HOSPITAL
TUBERCULOSIS DEPARTMENT
14TH AND ST. JOSEPH AVE.
GENERAL DEPARTMENT
400 CENTER ST.
CONTAGIOUS DEPARTMENT
14TH AND ST. JOSEPH AVE.
Des Moines, Iowa.

May 1, 1929

U. S. Gutta Percha Paint Co.,
Providence, Rhode Island.

Gentlemen:-

Two and one-half years ago we painted the interior of the new Southwest wing of Broadlawns Tuberculosis Department of Broadlawns Polk County Public Hospital, with Barreled Sunlight.

The work was done by our own painter
following the directions laid down by your
(The result was a beautiful job of
and thus far) the paint has st
fact. (when washed, and
all the appearance
to use Bar

Broadlawns, *Polk County Public Hospital, Des Moines, Ia.*

FROM BROADLAWNS comes praise for Barreled Sunlight's handsome finish, its washability, its durability.

Other institutions acknowledge Barreled Sunlight's help in providing a soft, agreeable light.

All users agree that its long-lasting whiteness and cleanliness materially reduce repainting.

Now Broadlawns, in common with numerous other users of Interior Barreled Sunlight, has turned to Outside Barreled Sunlight, for equally satisfactory results in exterior painting.

For full information on both Interior and Outside Barreled Sunlight, mail coupon. (See our catalog in Sweets.)

U. S. Gutta Percha Paint Co., 22 J Dudley Street, Providence, R. I. Branches or distributors in principal cities.

BROADLAWNS HOSPITAL SAYS:

"... a beautiful job of interior decoration ... has stood up very well ... when washed, and it is easy to wash, it retains all the appearance of new paint.

"We have also repainted the outside of the Tuberculosis Hospital with Outside Barreled Sunlight, which after one year seems to be in excellent condition."

Barreled
Reg. U. S. Pat. Off.
Sunlight

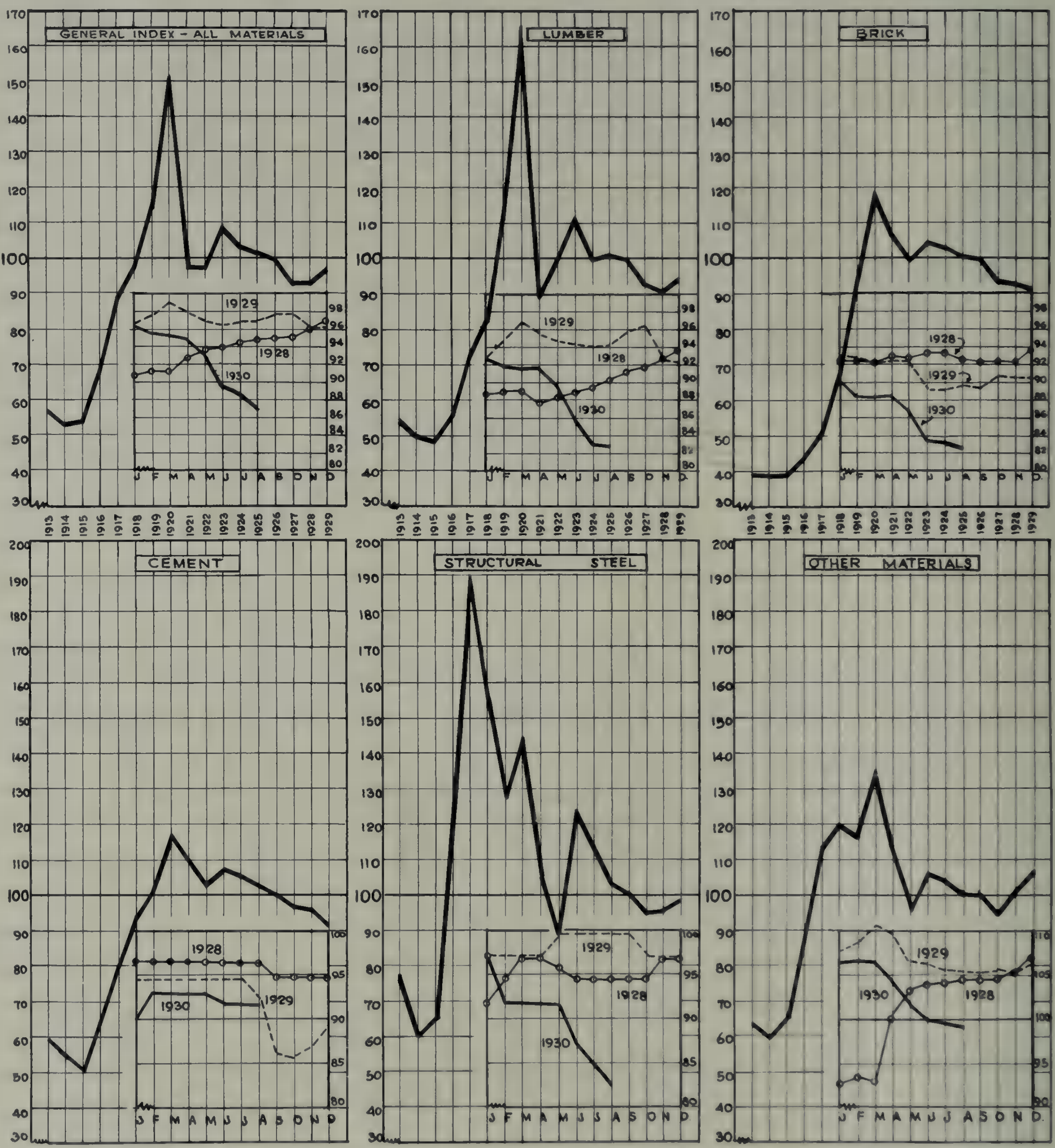
Easy to Tint

An all-oil product, Barreled Sunlight is readily tinted any desired shade with ordinary colors in oil. Quantities of 5 gallons or over are tinted to order at the factory without extra charge.

U. S. GUTTA PERCHA PAINT CO.
22 J Dudley Street, Providence, R. I.
Please send me—
(Check) ☐ Your booklet "The Whitest White House in Town" (Outside Barreled Sunlight).
☐ Your booklet "Information for Architects" (Interior Barreled Sunlight).
Name____________________
Street____________________
City________________State________

WHOLESALE PRICES FOR BUILDING MATERIALS

(1926 monthly average=100)



Data from U.S. Dep't of Labor

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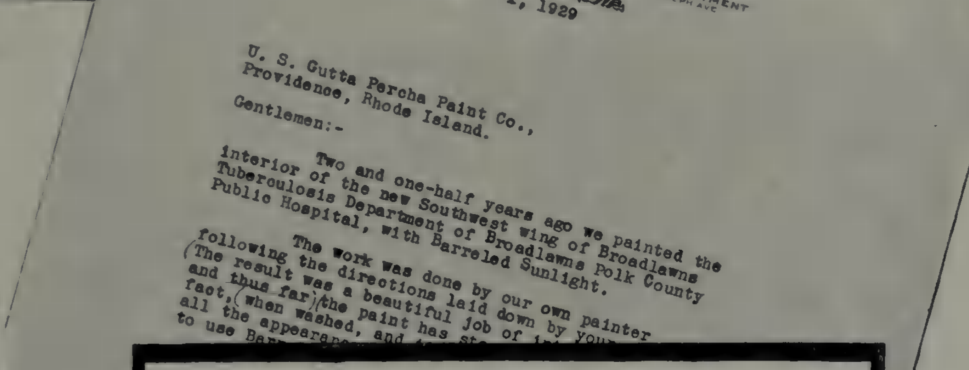
Can you *say as much* for the paint you specify?



Broadlawns
Polk County Public Hospital
Tuberculosis Department
14th and St Joseph Ave
General Department
400 Center St
Contagious Department
14th and St Joseph Ave
Des Moines, Iowa
May 1, 1929

U. S. Gutta Percha Paint Co.,
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Two and one-half years ago we painted the interior of the new Southwest wing of Broadlawns Tuberculosis Department of Broadlawns Polk County Public Hospital, with Barreled Sunlight.

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BROADLAWNS, *Polk County Public Hospital, Des Moines, Ia.*

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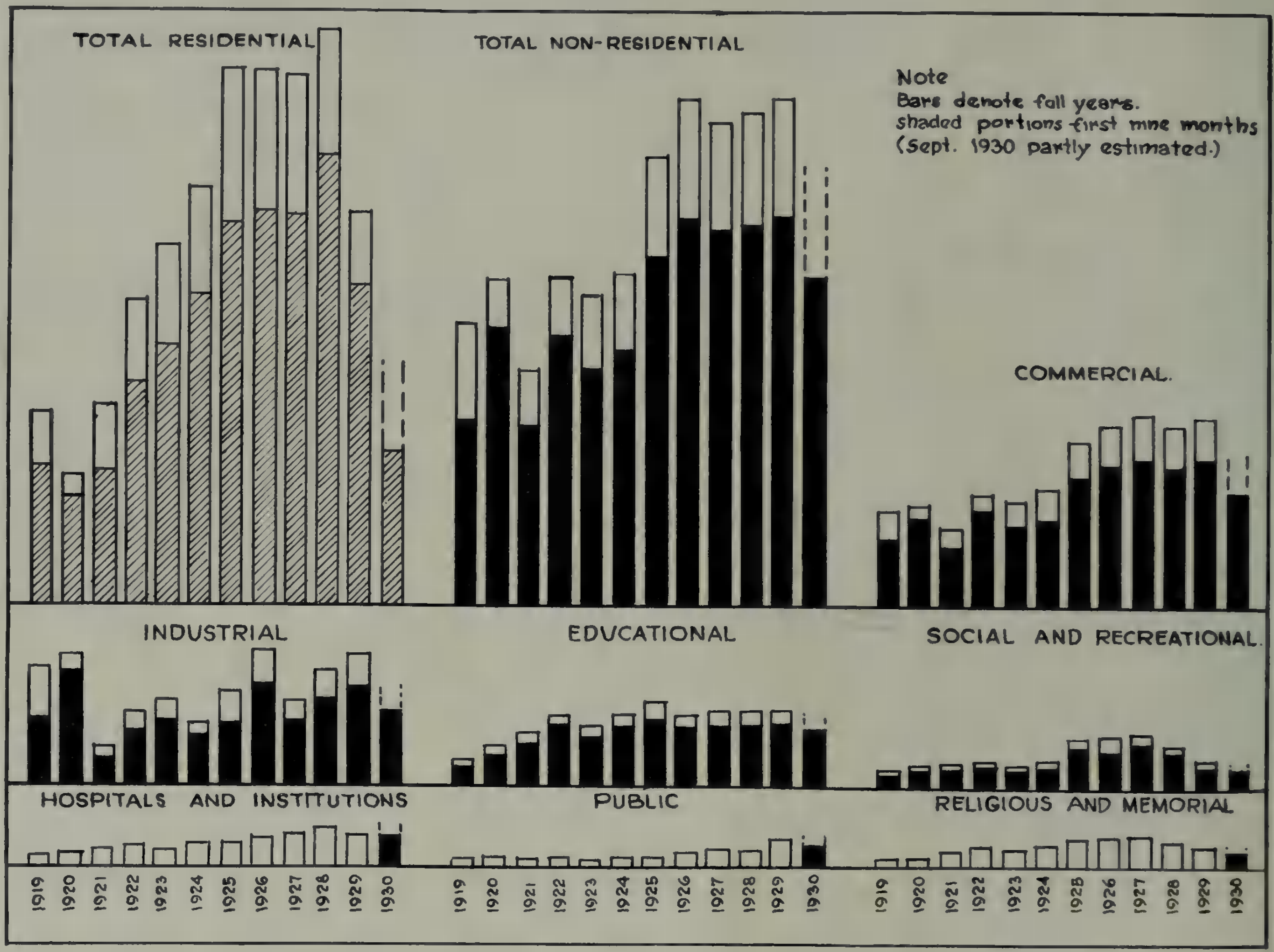
Please send me—
(Check) ☐ Your booklet "The Whitest White House in Town" (Outside Barreled Sunlight).
☐ Your booklet "Information for Architects" (Interior Barreled Sunlight).

Name____________________
Street____________________
City________________State________

NON-RESIDENTIAL BUILDING IN 27 NORTHEASTERN STATES, BY TYPES

(A Comparison with Residential Building)

1919 — 1930



(*Continued from page 359, Editorial Section.*)

From the record covering more than a decade it may be inferred that the construction of hospitals and institutions, religious and memorial buildings, and social and recreational buildings, which in the aggregate accounted for only 20 per cent of all non-residential building, has moved pretty much independent of purely economic considerations. Each type seems, however, to have had a cycle of its own which may have been due to activity largely occasioned by donations of various descriptions, the receipt of which, in some measure, has depended upon good business conditions. To a lesser degree, large activity in educational building, has rested also upon contributions though here the growing needs have been largely taken care of by governmental expenditures, either through taxes or bond issues, each reflective of existing general business conditions.

The volume of educational building undertaken in 1930 will approximate conditions of 1924; hospitals and institutions will almost surely exceed 1928, the last previous high year, the total for the first nine months practically equaling the entire year 1929; religious and memorial buildings should just about equal the 1929 total, itself lower than any previous year since 1923; while social and recreational buildings will likely fall to the 1924 level. It is of interest to note that these two latter types of building activity showed continuous expansion throughout the years 1919 to 1927 but for unimportant setbacks in 1923; that for the peak year 1927, each was about three times as large as in 1919; and that since 1927 each has moved downwards to a point where the relative declines are now substantial. Together these two types for the years 1926 and 1927 were more important than educational building and for 1927 about as important as industrial building.

For the first nine months of 1930 industrial building, on a total non-residential volume considerably below 1929, showed a ratio to total of 25 per cent—an experience essentially different from that of the three recent previous depression years. That there has been no appreciable change in the relative importance of industrial construction from what has been usual in periods of large general industrial activity may have been due to the same sort of stimulation here which has influenced the construction of public works and utilities, though this latter class of construction has perhaps been faced with a more genuine current demand than has either residential or non-residential building.

In last month's review it was pointed out that no real improvement in general construction may be expected unless revival takes place in residential building. It is very likely that the current depression in residential building will not deepen since the cumula-

Proud buildings deserve this new Frame with locked sill-joint

New Andersen Master Subsill Frame, showing trade mark die-cut in wood. This frame also is made in solid sill type.

TODAY the architect knows that the New Andersen Master Frame assures him custom frame quality plus a fine accuracy in construction which makes the frame adaptable to his special details.

That is why so many leading architects now specify "Andersen." » » » » » » » »

Note these features: genuine white pine, new locked sill joint, steep sill slope, adequate wide blind stop provision, guaranteed noiseless pulleys, a type and size for every need. More than 9,000,000 Andersen Frames are in service today, and the new Master Frame is the crowning achievement of 25 years of fine frame building. » » » » » » »

ANDERSEN FRAME CORPORATION, Bayport, Minnesota, has national distribution through 3,500 leading jobbers and dealers.

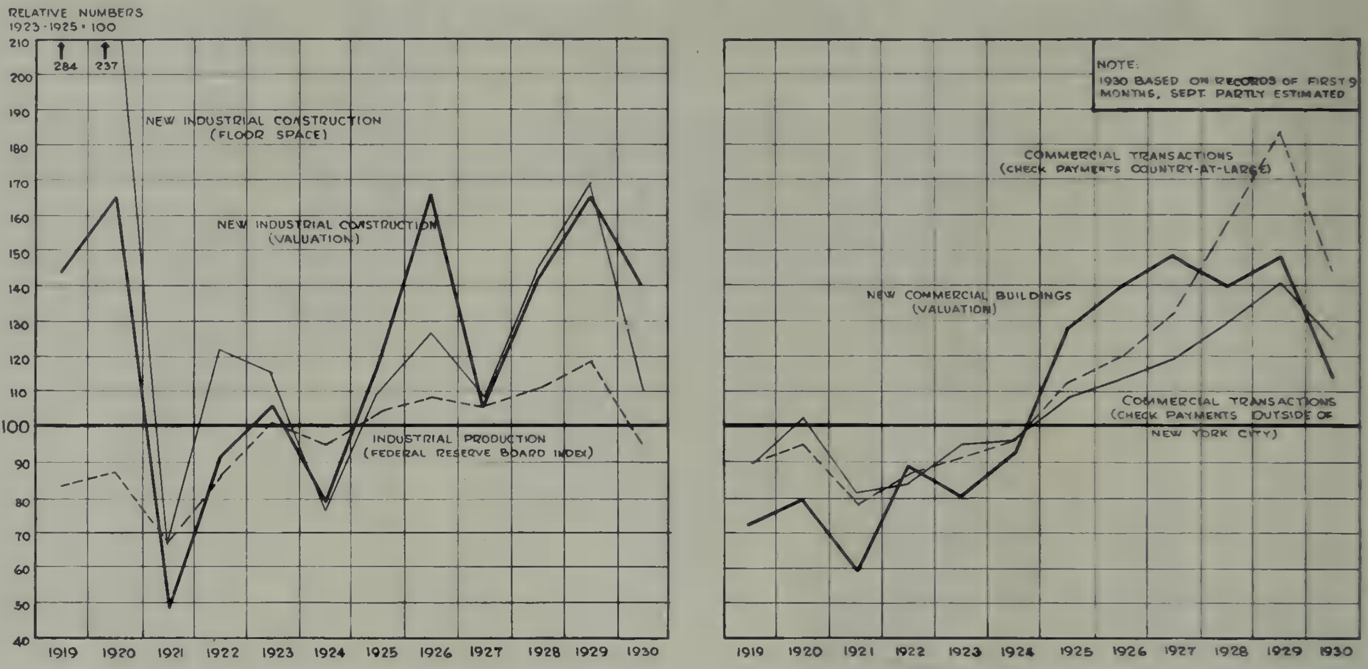
Andersen MASTER WINDOW and DOOR Andersen FRAMES **Frames**

FOR WEATHERTIGHT INSTALLATIONS—USE ANDERSEN SPECIFICATIONS

INDUSTRIAL AND COMMERCIAL BUILDING IN 27 NORTHEASTERN STATES

(A Comparison with Industrial and Commercial Activity)

1919 — 1930



tive relative declines from 1929 for the last three months ended August have been virtually stationary at something under 50 per cent below last year. For non-residential building there still seems to be further recession in sight in the light of the progressive relative declines recorded in the past three months; at the end of August non-residential building was 16 per cent behind the corresponding eight-month total ended August, 1929, at the end of July the decline was 13 per cent, while at mid-year non-residential building was off only 8 per cent. It is therefore highly probable that the remaining months of 1930 may show still further accumulated declines from 1929 as the year draws to a close because the more important types, commercial and industrial, remained at relatively high levels throughout the closing months of 1929. Residential building, on the other hand, is more likely to show better comparisons with 1929 from now on because of the drastic curtailment in this branch during the closing quarter of last year.

Commercial building, with unimportant deviations in 1923 and 1928 showed relatively the same general movements indicated for commercial transactions (check payments) throughout the period from 1919 to 1929, inclusive, except that for the first half of this period commercial building was on a lower plane than commercial transactions while in the latter half it was distinctly above. That there has been some commercial building in the past few years in excess of actual demand may, it seems, be reasonably inferred from this comparison, though, of course, factors of rising land values, obsolescence, and replacement have contributed largely to swell activity in commercial building. On a relative basis it would also appear that new industrial construction—at least during the five years ended 1929—has been expanded beyond demands of increased industrial activity as measured by the industrial production index of the Federal Reserve Board. In the period from 1921 through 1924 the two movements were in striking agreement, while in 1919 and 1920 industrial construction was far in excess of industrial output just as was the case in 1928 and 1929 and still seems to be the case for 1930.

That wholesale prices for building materials continued downward throughout August and into September in the face of a rising general commodity level due almost entirely to stronger prices for farm products and foods emphasizes the current depression in the construction industries. The general index of building materials is still above the general commodity level. Reports have accumulated to indicate that actual wages under existing union scales in the building trades have been accepted in certain localities; while increased efficiency on the part of building artisans, usually noted in times of slack employment, has operated to lower unit construction costs.

It would appear unlikely that lowered building costs can alone provide a basis for revival in building activity. Space occupancy can no more be doubled by a halving of unit rental costs than can the consumption of meat be increased 100 per cent by a 50 per cent reduction in price, though the demand for food is, to be sure, somewhat more inelastic. Any genuine impetus must come from a closer gearing of supply to demand. In the field of residential building much of "the rough road" has already been traveled but in the principal branches of non-residential building it would appear from the record for 1930 that this movement has only lately begun. Though we speak of easy money, in reality money for the building of projects other than essential is virtually non-existent; especially is this true since lending institutions are known to be tending towards increased conservatism in their desires to appraise better the all-important relationship of supply and demand.

L. Seth Schnitman

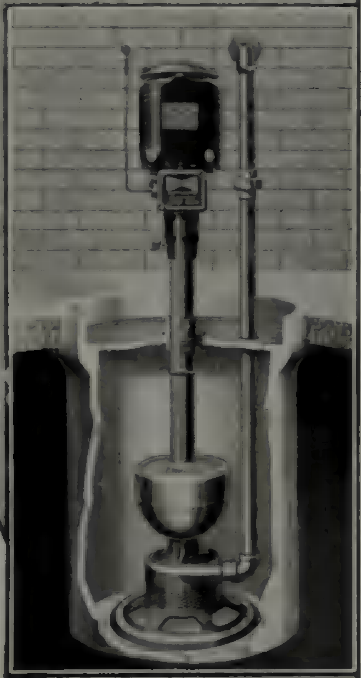
when it RAINS *and* RAINS *and* RAINS

A Dry Basement

ALTHOUGH this home was built in a new subdivision that is without sewerage facilities, its owner will never be troubled with a wet basement, no matter how hard or how long it rains. The architect had it equipped with a Penberthy Pump that handles all basement seepage and drainage quickly and quietly.

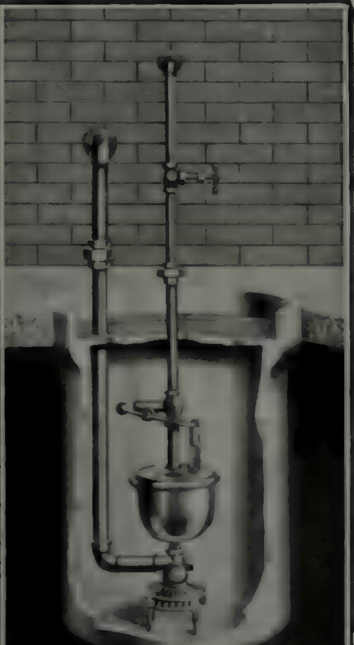
Both the electric and water operated pumps are immune to corrosion . . . they are copper and bronze throughout. Both are automatic and thoroughly dependable under the most severe operating conditions; they are economical of electricity and water power. Both have a minimum space requirement and are easy to install.

Penberthy Pumps are quickly available from the stocks of leading jobbers throughout the country.



Penberthy Automatic Electric Sump Pump

Penberthy Automatic Cellar Drainer (Water Operated)



PENBERTHY INJECTOR COMPANY
DETROIT
Canadian Plant Windsor, Ont.
Established in 1886

PENBERTHY PUMPS
PREVENT FLOODED BASEMENTS

PENBERTHY PRODUCTS

REVIEWS OF NEW BOOKS

ESTIMATING CONSTRUCTION COSTS. G. Underwood. *McGraw-Hill Co.*, N. Y., 1930; 620 pp. $6.00.

APPRAISERS AND ASSESSORS MANUAL. Prouty, Collins and Prouty. *McGraw-Hill Co.*, N. Y., 1930; 500 pp. $5.00.

NEW BUILDING ESTIMATORS' HANDBOOK. William Arthur. *Scientific Book Corp.*, N. Y., 1930; 1024 pp. $6.00.

These books are all put forth to make estimating easy. Quantity surveying methods and means of computing construction costs are indicated. The first volume contains good charts for rapidly estimating labor time charges on various methods of construction. The second book is primarily for taxation purposes, but offers assistance to the architect and engineer: various building types are analyzed. The third book is a revised edition of an older work.

INSPECTOR'S POCKET BOOK. Austin T. Byrne, revised by S. T. Goldsmith. 244 pp.

A handbook for building inspectors, printed in offset from typewritten sheets. Material is presented in condensed, outline form.

PERSPECTIVE PROJECTION. E. I. Freese. *Pencil Points Press*, N. Y., 1930; 43 pp.; 10 plates.

This is another of the large group of handbooks that indicate methods of drawing buildings and other objects with horizontal vanishing points. Perspective is not applied to vertical lines as in reality nor is isometric drawing, a far more convincing method of indication, given a single page of comment or illustration. However, simple methods of projection, minimizing drafting, are given ample discussion.

PROMOTING NEW HOTELS. W. I. Hamilton. *Harper and Brothers*, N. Y., 1930; 158 pp. $2.50.

This book discusses, first, *why* (under what conditions) a new hotel building may fail to succeed financially and for good of a community; and second, *how* to plan a community's hotel development along sound and stable lines. Topics such as, Launching the Typical Community Hotel Project, Securing Business and Common Pitfalls, are covered. The book is not exhaustive in its treatment but worthwhile condensed data are offered.

ENGLISH MONASTERIES IN THE MIDDLE AGES. R. Liddesdale Palmer. *Richard R. Smith Publishing House*, N. Y., 1930; 233 pp. $8.00.

A scholarly work presenting an outline of the origins and customs of the monastic orders. Cloisters, churches, extra-claustral buildings are illustrated and building methods discussed. Excellent as a historical document.

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ARTISTICALLY MODERN

■ ■ The outstanding harmony between interior design, and—lighting by PEARLMAN is immediately apparent.

All of our facilities are available to the architectural profession for research and consultation. Ask us to send you our series of Lighting Studies in plate form as they appear —no obligation of course. » » »

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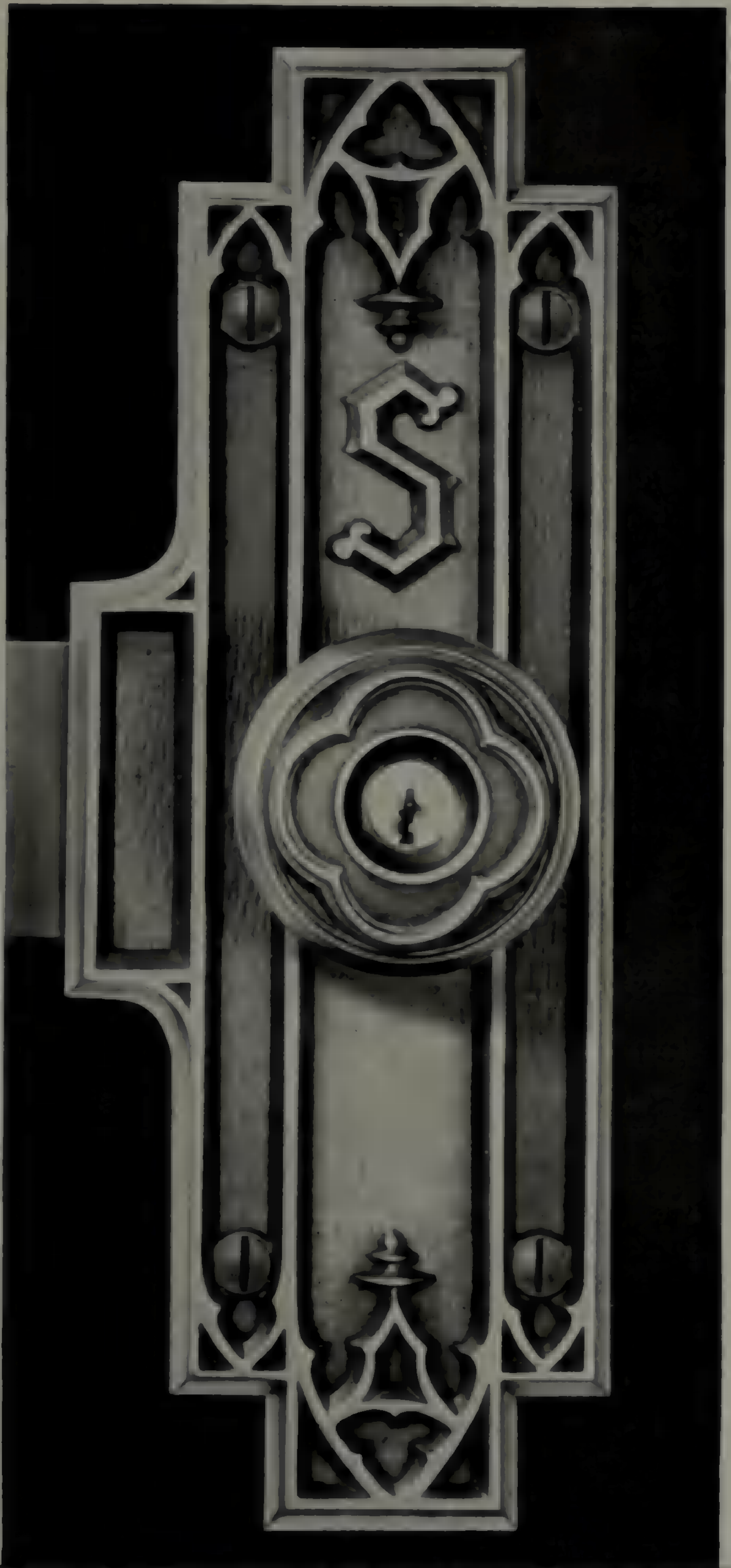
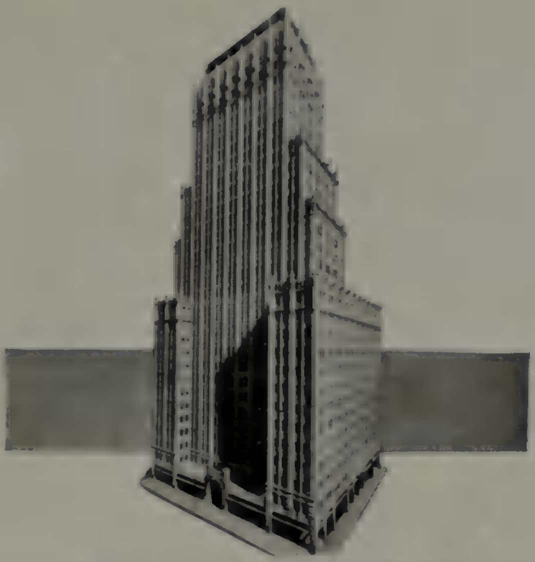




STERICK BUILDING, MEMPHIS

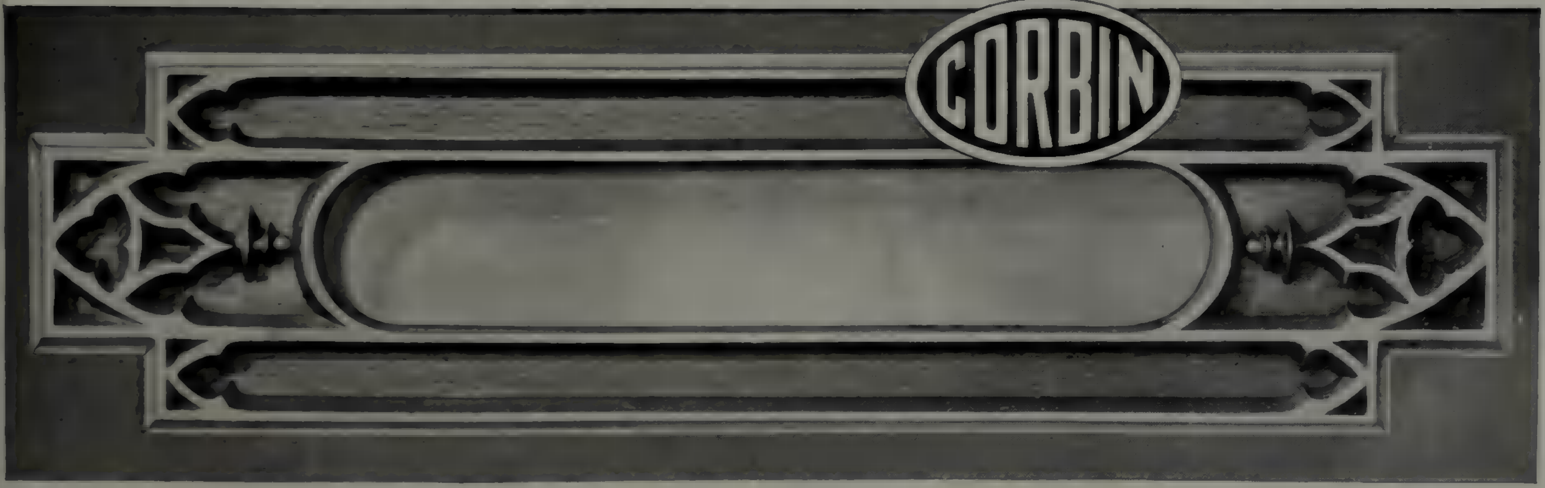
Architect: Wyatt C. Hedrick, Inc., Fort Worth, Texas.
Contractors: Bellows-Maclay Construction Company, Dallas, Texas.

2464 Corbin *Unit Locks* as used in corridor doors of Sterick Building, Memphis—tallest building in the South. *Trinity* design escutcheon bears letter "S", and this same letter appears on inside knobs. Finish, light statuary bronze. On the inside of the door plain bronze hardware used in light statuary bronze finish. The *Trinity* design letter drop is made especially for this building. Light statuary bronze finish with high lights polished.

No. 161½ Corbin cast iron butts are also used, polished and finished in light statuary bronze. Other Corbin items correspond in quality and finish.

P. & F. CORBIN Since 1849
NEW BRITAIN, CONNECTICUT, U. S. A.
The American Hardware Corp., Successor
New York Chicago Philadelphia

GOOD BUILDINGS DESERVE GOOD HARDWARE



New St. Elizabeth's Hospital, Chicago, Ill.

Another
HOSPITAL
installs
RCA
CENTRALIZED RADIO

To keep patients in good spirits and to speed them on the road to recovery, hospital directors, superintendents, doctors and architects throughout the United States are installing RCA Centralized Radio

To afford the modern hospital the finest in centralized radio equipment at low cost, RCA offers a centralized receiving system which distributes as many as four different broadcast programs to as many as 5,000 rooms.

By touching a wall switch, the patient can get whichever program he prefers.

RCA Centralized Radio is simple, economical, prevents future wiring costs, and avoids unsightly individual aerials and lead-in connections.

RCA engineers design apparatus to fit the job—the job is never forced to fit the apparatus.

Let us prepare Estimates

Descriptive pamphlets of this system and photographs of typical installations are available to architects and hotel executives.

Without any obligation, we shall gladly prepare plans and estimates for installations of any size.

FOR APARTMENTS

Where the use of individual sets in the rooms, plugged into wall outlets, is desired, there is a separate RCA Centralized System especially designed for the independent use of as many as 80 sets of different makes, operated from a single antenna. Additional groups may be operated from other antennae, if desired. The superior reception assured by this system makes for greater tenant satisfaction and higher rentability.

Engineering Products Division, Section A
RCA VICTOR COMPANY, INC.
233 Fifth Avenue New York City
Representatives in Principal Cities
Visit the permanent RCA Centralized Radio Exhibit at the RCA-Victor Salon, Boardwalk, Atlantic City

NOTES IN BRIEF

FAMOUS ARCHITECTS?

Who are the ten greatest American architects? This question has been raised by President Ricketts of Rensselaer Polytechnic Institute and referred to The Architectural Record. Appropriate candidates for the profession's honor roll are sought so that their names may be inscribed on the stone spandrels of a building which is being erected at Troy, N. Y., to house the school of architecture.

The suggestion that the names should be limited to American architects came from Prof. Joseph Hudnut, Columbia University, in response to an inquiry from President Ricketts. His letter is reprinted herewith:

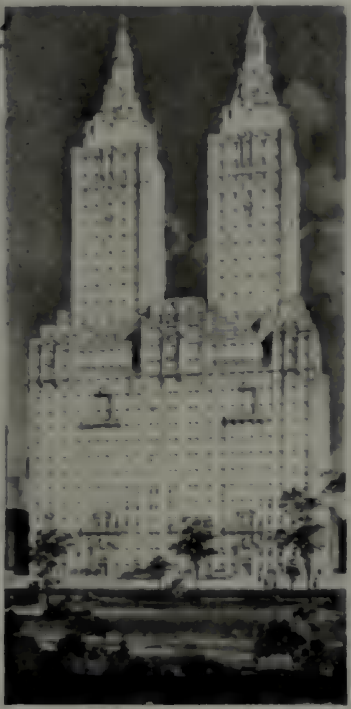
> Dear Mr. Ricketts:
>
> I have talked over the selection of the names of great architects, referred to in your letter, with several members of our staff. They are greatly interested. It seems to me that you ought to confine your selection to architects of the Renaissance, because the names of the greatest architects before that time are for the most part unknown. My suggestion is:
>
> Brunelleschi
> Palladio
> Mansart
> Bramante
> Michelangelo
> Gabriel
> Peruzzi
> LeNotre
> Jones
> Sanmichele
> Wren
> McKim
>
> If I were in your place I would confine my selection to American architects. I think that that would be a unique and interesting thing to do, and it seems proper that American architects should, for once, be honored. Besides this would have a certain "publicity value": everyone would ask who these men were and how they happened to be selected from among the mass of architects. You would have a "Hall of Fame," like New York University. That, in turn, would have a good effect upon the status of the architectural profession: people would be surprised to learn that architects were of enough importance to have their names carved upon stone on the facade of a building. Did you know that in the entire world there is only one monument erected to the memory of an architect? 300,000 generals, 400,000 politicians, one architect.
>
> Here are the ten greatest American architects:
>
> Bulfinch
> Renwick
> Burnham
> Jefferson
> Richardson
> Goodhue
> Mills
> Sullivan
> La Trobe
> McKim
>
> I have included only those who are dead (physically).
>
> Yours very cordially,
> Joseph Hudnut

Criticisms, and additions to this list of architects are requested by President Ricketts in order to

(*Continued on page 100*)

WHAT MADE THESE NEW YORK APARTMENT HOUSES EASIER TO RENT?...INCLUDE 11,076 KOHLER FIXTURES AND FITTINGS IN YOUR ANSWER

A bathroom with STANDISH *vitreous china lavatory and* VICEROY *tub each having Kohler Dynamic fittings.*

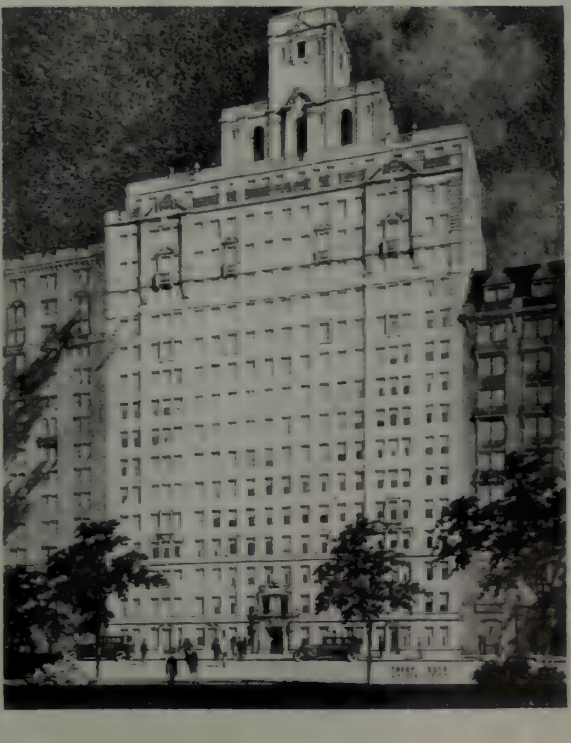


IN NEW YORK or any other place, the bathroom is the most important room in the house. You know it. Home-hunters know it. They look at the bathroom first. They expect, rightly, clear pipes, efficient faucets and drains. They want tubs of good design; lavatories, closets and fittings soundly constructed and in correct taste. They ask for—and get—colors that are clear and uniform.

Architects recognize the trend. Generally, they follow the one wise practice: Specify the kind of fixtures and fittings that good taste, good business instruct. And in the best and finest places going up today—apartment houses never before equaled for size, luxury, and elegance of appointment—all-Kohler installations are increasingly evident. Here, for example, are three recent New York apartments, completely Kohler-equipped, with a total of 11,076 Kohler fixtures and fittings!

It's perfectly logical that all-Kohler installations should make any apartment house or a home easier to rent or sell—especially where competition is severe. If the bathroom and the kitchen are right, the whole place gets credit. High principles in plumbing are evidence of high principles at other critical points. Actual money savings add to the yearly dividends of satisfaction and security.

Kohler Co. *Founded* 1873. Kohler, Wis.—*Shipping Point,* Sheboygan, Wis.—*Branches in principal cities.* . . . Look for the Kohler trade-mark on each fixture and fitting.



The San Remo, apartment at 74th and 75th Streets and Central Park West, New York City. Emery Roth, Architect. H. R. H. Construction Co., Builders. Sam Minskoff, Plumber. Dimock & Fink Company, Jobbers.

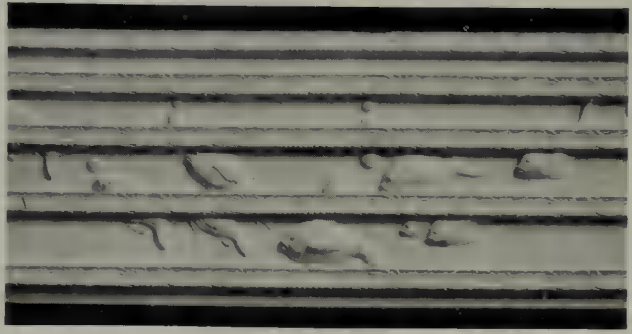
Beresford Apartment House, 81st and 82nd Streets and Central Park West, New York City. Emery Roth, Architect. H. R. H. Construction Co., Builders. Frank B. Lassette, Plumber. E. F. Keating Co., Jobbers.

Apartment at 12 West 81st Street, New York City. Emery Roth, Architect. H. R. H. Construction Co., Builders. Sam Minskoff, Plumber. Dimock & Fink Company, Jobbers.

KOHLER OF KOHLER

PLUMBING FIXTURES

The new
Jacobson Catalogue



MODERN
DESIGN

For the last twelve months the designers and modelers of Jacobson & Company have been at work compiling the material for this new Catalogue. The new models pictured are the creation of our own designing staff, and have been selected for publication as being eminently usable in various types of buildings.

May we send you your copy, free?

Now that the new Catalogue is printed, bound and ready for distribution, we are presenting a complimentary copy to all recognized architects, builders and decorators.

In order to verify your present address, won't you please drop us a line on your letterhead. Deliveries of the book are made in the same order in which requests are received.

JACOBSON & COMPANY
239-241 East 44th Street
New York

NOTE: Models listed in former catalogues are always available.

determine the consensus of opinion in the architectural profession. Suggestions may be sent either to the editorial department of The Architectural Record or to Prof. Ralph G. Gulley, dean, Rensselaer School of Architecture, Troy, New York.

ANNOUNCEMENTS

Philip H. Johnson, architect and engineer, announces the removal of his offices from the Widener Building to the twenty-second floor of the Architects Building, Seventeenth Street at Sansom, Philadelphia.

G. Massera and A. V. DuPont have recently arrived from France to practice architecture in this country. Their temporary address is Nemours, Wilmington, Delaware.

Samuel Marvin Smith, architect, announces the removal of his offices to 615 Shoreham Building, 15th and H Streets, N. W., Washington, D. C.

George R. Callis, Jr., architect, announces the removal of his offices from the eighteenth and nineteenth floors of the Hearst Tower, Baltimore, to his new offices and studio at 13 Melvin Avenue, Catonsville, Maryland, and requests that manufacturers accordingly change their mailing lists.

Ernest Howard Yardley, architect, 112 South 16th Street, Philadelphia, wishes to announce that he now has as associates J. Layng Mills of New York and Leon J. Meyung.

GEORGE BURDETT FORD

George Burdett Ford, architect and city planner, who died on August 15 was born in 1879 at Clinton, Mass. Mr. Ford was graduated from Harvard University in 1899 and afterward took up engineering and architecture at the Massachusetts Institute of Technology and at L'Ecole des Beaux Arts, Paris.

Notable in Mr. Ford's work was his service as consultant to the Committee on City Planning of the Board of Estimate and Apportionment of New York City and to the Commission on Building Districts and Restrictions. From his work on the latter commission emerged largely the present New York zoning and height regulations. Mr. Ford had been an advisor to the Regional Plan of New York and Its Environs since its inception and was one of a group of planners who made the preliminary study of the region and prepared maps dealing with land uses and means of traffic.

Among the cities he helped to plan were Trenton, Newark, Jersey City, Passaic, Elizabeth, Perth Amboy and East Orange, N. J.; Port Chester, New Rochelle, Mamaroneck, Ossining, Tarrytown, Scarsdale, Mount Kisco and Glen Cove, N. Y.; New Haven, Conn.; Springfield and Worcester, Mass.; Wilmington, Del.; Chester, Pa.; Cincinnati and Dayton, Ohio; Louisville and Lexington, Ky.; Richmond and Norfolk, Va., and Charleston, S. C.

(*Continued on page 102*)

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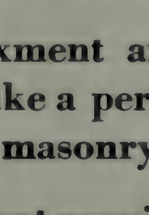

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INDOAKO
WOOD

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INDOAKO is steadily gaining in popularity for all types of work: residences, office and public buildings, churches and schools. Paneling is by no means the only use to which this remarkable hardwood is put, although it is there that its beautiful quarter-sawn ribbon grain shows up to greatest advantage. INDOAKO is ideal for all interior trim, flooring, doors, cabinet work, church pews, etc. Its strength and durability, its ease of working and finishing and the excellent sizes in which it is available, combine to make it one of the most adaptable of hardwoods. And it is reasonable in cost, because imported *duty-free* from an American possession. Get all the facts about INDOAKO. The coupon will bring them to you, free of charge.

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FLAT ROOFS AND DOCTORS

"Although many of us have collaborated with doctors in the planning of hospitals, we have hardly realized yet the importance of their point of view in the arrangement of houses. Lens has a genuine complaint, for he speaks from a personal experience. He lives on the northern edge of St. John's Wood, in an oldish house with a pitched roof, except for one small part 13 ft. square, which has a flat roof. To the latter, access has been made, and for a few pounds Lens has acquired 'a new living room, a new toy, a sleeping place, a solarium and an observatory.' This experience leads him to the declaration, 'All these pitched roofs . . . represent stupid waste of . . . civic area.'

"We have much sympathy with the doctor's point of view. We will summarize the objections to it; as shortly as possible because to do so will seem to our modernist friends like crossing the *t* and dotting the *i* of obscurantism. A flat roof with a suitable surface for walking on, and protected by a parapet, is dearer than a pitched roof: an air-space between the ceiling and the roof gives insulation from heat in summer and cold in winter; it follows there is less risk of condensation; the tiles or slates covering a pitched roof are rather more reliable than the coverings of a flat roof; the elimination of pitched roofs will cause a wide dislocation of employment. But our main difficulty is with our clients, whom Lens would like us to persuade to his point of view. For our clients usually like sloping roofs, but entirely for sentimental reasons.

"Can we blame our clients for preferring the cheerfulness and assurance of pitched roofs to the dubious delights of sun-bathing with flies, or snoring to thunder; or for holding that any number of Bathshebas fail to banish the impression that German housing schemes look dull?

"But in so far as Lens considers there should be closer relations between his profession and ours, both our clients and ourselves agree. We are a nervous generation and health seems to us the prime necessity; just as the soldier moulded the buildings of the Middle Ages, and the gentleman those of the Renaissance, so the doctor's influence is predominant today. Every house-building client must be asked if he wants a solarium, either on the roof or as a recessed veranda or loggia, and even though we retain our slopes over the main blocks, we can form a flat roof in a subsidiary position and make the best of both worlds. . . ."

—From *The Architects' Journal*
August, 1930

A CORRECTION

In the Technical News section of the September, 1930 issue, the captions under the Savarin Restaurant, Graybar Building, New York City and the Savarin Restaurant, New York Life Insurance Building, should have been credited to The John Van Range Company.

We wish to add that technical information was obtained from *Planning Restaurants That Make Money*, published by the John Van Range Company.

Stedman Reinforced Rubber Tile

in natural color veinings

offers the *complete* floor • • quiet, comfortable, and wear-resisting • • with twenty-seven color types permitting unlimited arrangement in design to meet the exacting needs of each interior • • And service from creation to installation, by experts • • A booklet with color charts will be sent you gladly.

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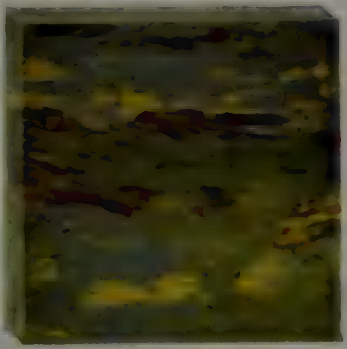
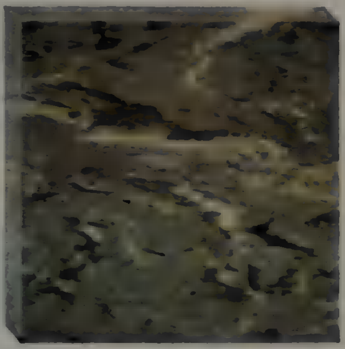
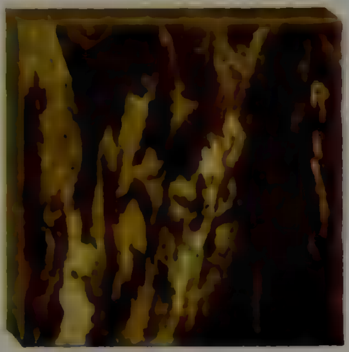


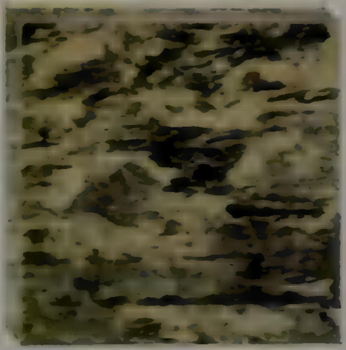
Grey Walnut Gold
Grey with veinings of
Walnut and Gold



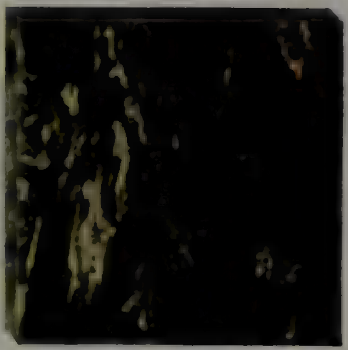
Grey Paisley
Grey with veinings of
Black and Cream



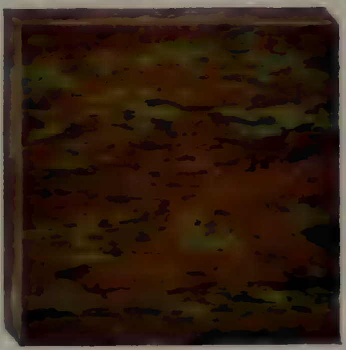
Walnut Paisley
Walnut with veinings of
Gold and Cream



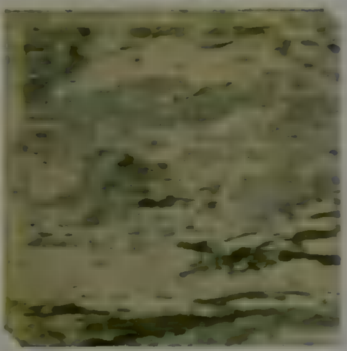
O.S.
Cream with veining of
Black



Black White
Black with veining of
White

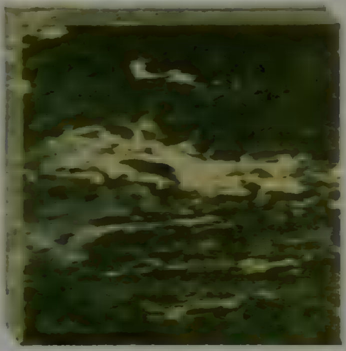


Brown Green Paisley
Brown with veinings of
Sea Green and Black

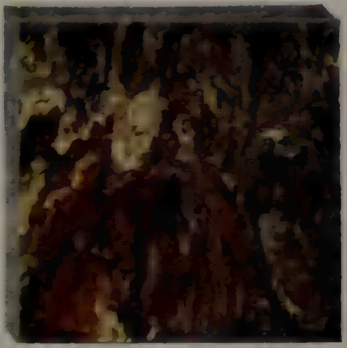


White Sea Green
White with veining of
Sea Green

Black Red
Black with veining of
Dark Red

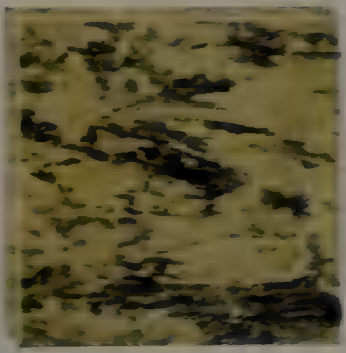


Sea Green White
Sea Green with veining
of White

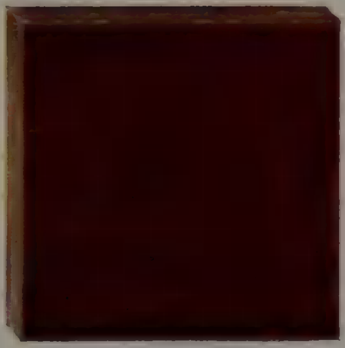


Slate Red Paisley
Slate with veinings of
Dark Red and Cream

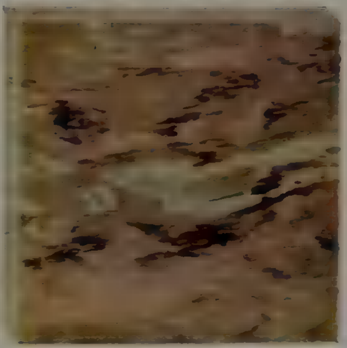
Brown Black
Brown with veining of
Black



Buff Black
Buff with veining of
Black



Dark Red



Napoleon Grey
Grey with veinings of
Pink, Cream and Black

***REINFORCED: In the Stedman Process minute cotton filaments, uniting with the rubber under high pressure and heat, are responsible for its unusual resistance to wear and distention, its lasting resilience and smooth, impervious surface—characterized by color veinings of remarkable fineness and beauty**

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To make QUALITY the determining factor in the selection of efficiency devices for office or factory is no more than just good business. This is why the leaders of American business and industry have consistently selected Strowger P-A-X in preference to all other interior telephone systems. They know that, while it is possible to buy cheaper equipment, only Strowger P-A-X can be depended upon to render swift, accurate and trouble-free communication service, day after day, and year after year, with a minimum amount of attention.

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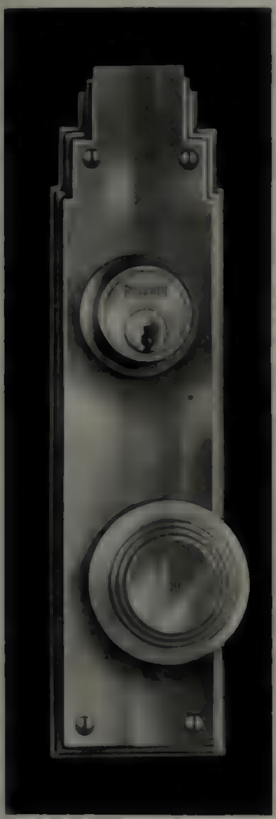
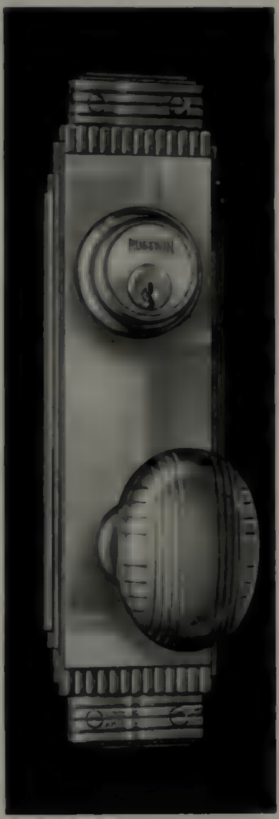
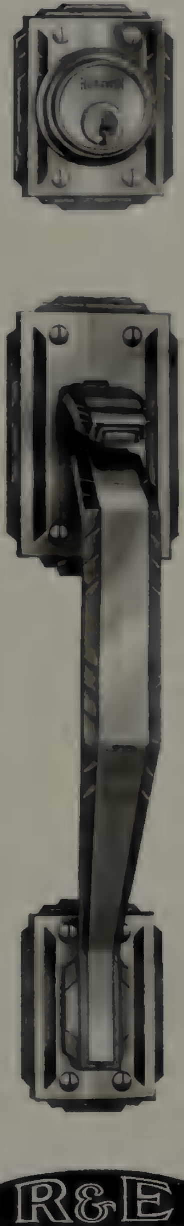
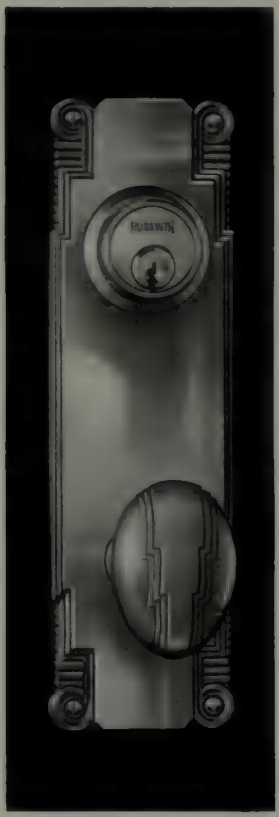
MODERNISTIC creations in HARDWARE by RUSSWIN

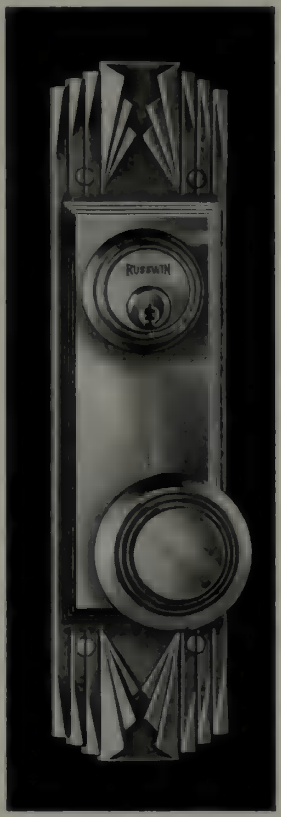
Five exclusive Modernistic designs by Russwin are shown on this page. The illustrations are about one third size. Russwin, acknowledged originator of distinctive Modernistic hardware of the finest metals (Bronze or Brass), is constantly adding to its line, thus keeping pace with all that is new and authentic in architectural thought and design. Russell & Erwin Manufacturing Company (The American Hardware Corporation, Successor), New Britain, Connecticut —New York, Chicago, London.











For the architect's convenience, Russwin Hardware is illustrated and described in Sweet's Catalogue — pages C-3137; C-3216.

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Hardware that lasts — Base Metals of Bronze or Brass

ALUMINUM PAINT—THE COAT OF METAL PROTECTION

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Both sides of lumber absorb moisture— Prime *both* with Aluminum Paint

Don't overlook the fact that lumber has *two* sides. When you prime one side only you have done but half of the real priming job. Moisture penetrates wood from both sides.

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Aluminum Company of America does not sell paint. But aluminum paint made with satisfactory vehicles and Alcoa Albron Powder may be purchased from most reputable paint manufacturers, jobbers and dealers. Be sure the pigment portion is Alcoa Albron and is so designated.

Let us send you the booklet, "Aluminum Paint, the Coat of Metal Protection". Address ALUMINUM COMPANY of AMERICA; 2467 Oliver Building, PITTSBURGH, PENNSYLVANIA.

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A monument which
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TERRA COTTA
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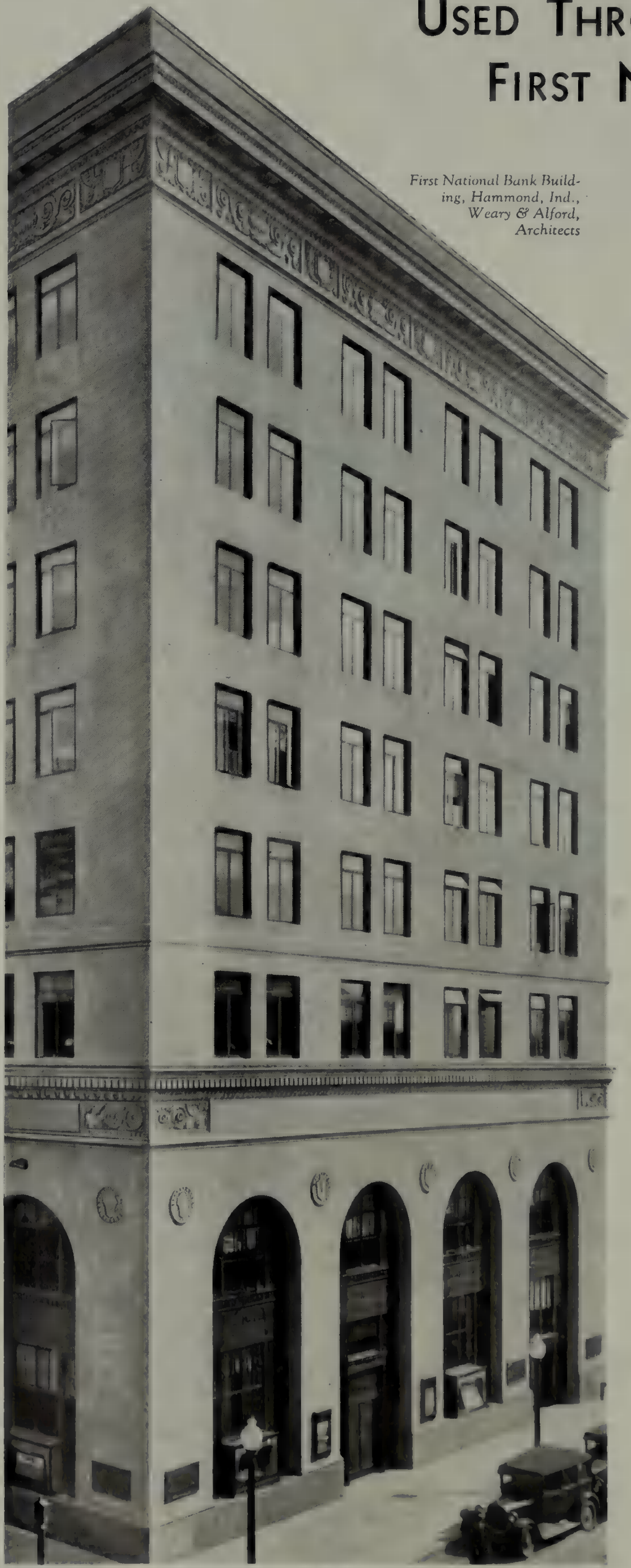
CRITTALL CASEMENTS

USED THROUGHOUT THE HAMMOND FIRST NATIONAL BANK BUILDING



First National Bank Building, Hammond, Ind., Weary & Alford, Architects

AS AN example of the effective use of Crittall Casements in a modern office building, the home of the First National Bank in Hammond, Indiana, is extremely interesting from an architectural standpoint. Not only have Crittall Casements been employed in beautifying the ornamental portions—but also they have been installed *throughout the entire building!*

In the banking quarters, in the exclusive shops and in the private offices Crittall Casements serve a utilitarian as well as an artistic purpose. They provide abundant light—proper ventilation—and perfect protection against wind and weather. In addition, these sturdy steel windows operate easily and are free from sticking or rattling.

Today, Crittall windows are being more widely used than ever before. Built by the largest manufacturer of metal casements—with factories all over the world—they are available for all types of buildings.

Three separate and complete lines are offered. Stanwin and Norman Casements are stocked in standardized styles and sizes—while Universal Casements are built to order in either steel or bronze.

Refer to our complete catalog in Sweet's—pages A1131 to A1200—for details and specifications.

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DELIVERED
IN ONE BAG

GOOD waterproofed concrete is made with a Portland cement that has the waterproofing material ground with cement clinker during manufacture. Such waterproofing is correct in amount and is uniformly distributed. Delivered in one bag, it saves time, labor and supervision on the job. It removes human hazards associated with job-mixing waterproofing and Portland cement. Anyone who can make good concrete can make good waterproofed concrete with Medusa *Waterproofed* Cements (white or gray). Best of all, it will be permanent. This is proved by 20 years of successful use.

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A DIEBOLD BANK VAULT

BY NIGHT

DIEBOLD VAULTS close banks to bandits at night—now Diebold-Lake Erie Tear Gas disarms bandits in broad daylight! At night crooks despair of opening a Diebold Vault Door when it is closed and fully checked. They have thrown away their electric arcs and their nitroglycerin, and use firearms instead. Now they are daylight bandits—dangerous felllows, that take a bank unawares while its vaults are open and its valuables unlocked. Armed to the teeth, they're a menace to *life* as well as property. ★ ★ Diebold has turned its attention to *bank protection even while the Diebold Vault Door is open.* Today, with harmless but effective tear gas, we protect banks, their property, employees, and patrons against bandits. This tear gas renders the bandit helpless instantly, and keeps him that way until the police arrive. ★ ★ The Diebold-Lake Erie Tear Gas installation is so arranged that it will completely cover the room in a few seconds. Any teller can set it off—even with his hands above his head. The bandit is captured then and there. No one is hurt. No money is lost. ★ ★ We now present 24-hour bank protection—Diebold-Lake Erie Tear Gas by day—Diebold Bank Vault by night. Write for booklet on tear gas installation and full particulars.

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Joseph Urban, in designing the decorations for the Central Park Casino, selected Black Carrara for the low ceilings of this brilliant room.

CEILINGS THAT SEEM TO DISAPPEAR!

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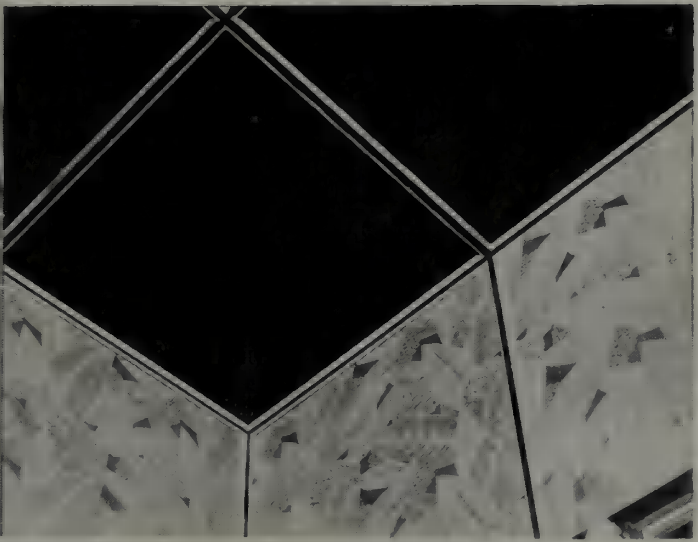


CARRARA

Modern Structural Glass

The New Dahlquist Turbo-Aquatherm

(U. S. Patent No. 1,762,215 June 10, 1930)

Automatic Gas Unit
with Side Arm

Experts have long recognized that the ordinary hot water boiler serves as an efficient sediment trap. This is due to the fact that it contains a relatively large volume of quiet water and hence any sediment or insoluble matter which normally remains in suspension in the water lines gradually sinks to the bottom of the boiler.

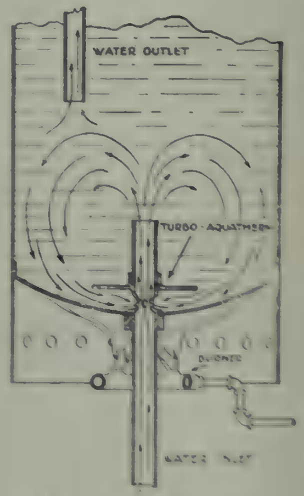
This continual accumulation of sediment is one of the greatest enemies of the efficient satisfactory operation of the hot water boiler. If allowed to accumulate long enough it will cause surges of rusty muddy water in the hot water line and in the case of underfired or automatic storage units, it forms an insulating blanket on the bottom between the water and the metal itself which is the greatest cause of burnouts. Furthermore hot water accumulated in the ordinary boiler becomes stagnant and unsuitable for domestic purposes.

The TURBO-AQUATHERM

(U. S. Patent . 1,762,215 June 10, 1930)

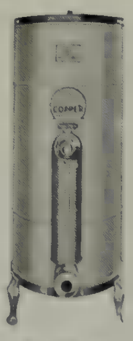
In order to absolutely prevent the accumulation of sediment which is the great enemy of the efficiency and life of hot water boilers, Theodore W. Dahlquist has invented a device called the TURBO-AQUATHERM which takes advantage of the velocity of the incoming cold water to create a suction and a whirl which constantly sweeps and scours the bottom of the boiler carrying every particle of foreign matter out of the system. No sediment can ever accumulate in the Dahlquist TURBO-AQUATHERM Copper Boiler and the water is always as fresh as that in the cold water lines and may be safely used for cooking as well as for other household purposes. Furthermore the danger of burnouts in automatic storage and underfired systems is eliminated and the thermal efficiency of the boiler is greatly increased. The accompanying sketch shows clearly the action of the TURBO-AQUATHERM which may be had with little additional cost on all Dahlquist range boilers and automatic storage.

Write now for full particulars regarding this revolutionary improvement in hot water boilers.



Arrows show action of water when drawn thru TURBO-AQUATHERM scouring bottom of boiler and preventing any accumulation of sediment

Super-aqua-
therm Gas
Underfire



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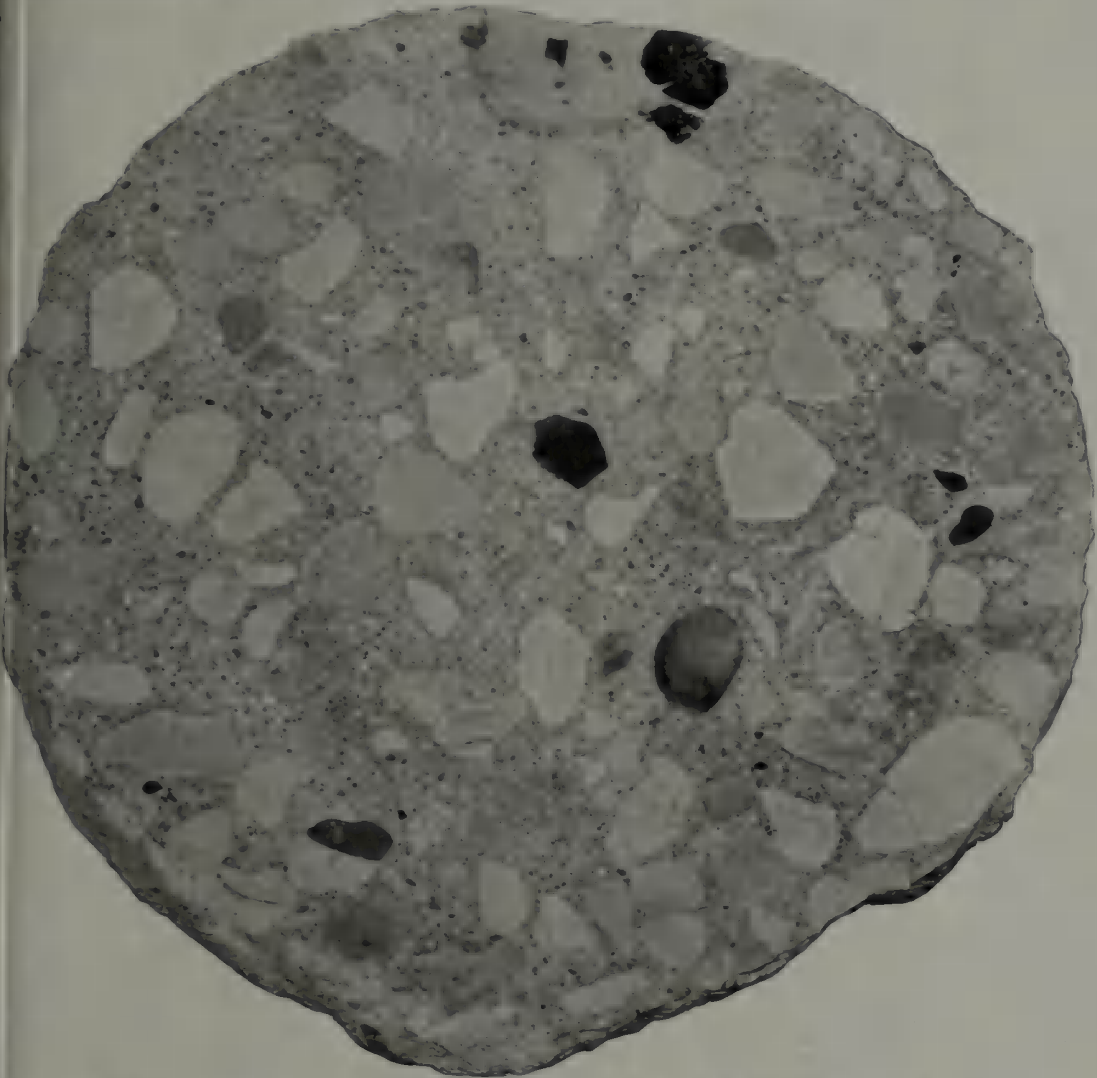

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J. J. Hyndes, Cons. Supt.

1919 — At Montreal, 65 tons on one pile caused [illegible] settlement. Contract for Montreal Harbour Comms., *F. W. Cowie, Ch. Eng.*

1916 — This 70 ton test made [illegible] 1 MacArthur Pile at Port Arthur, Texas. No settlement. *Wm. B. Ittner & Assoc., St. Louis, Archts. and Engrs.*

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are installed as stair stringers in Pittsburgh's Cathedral of Learning

J&L STEEL

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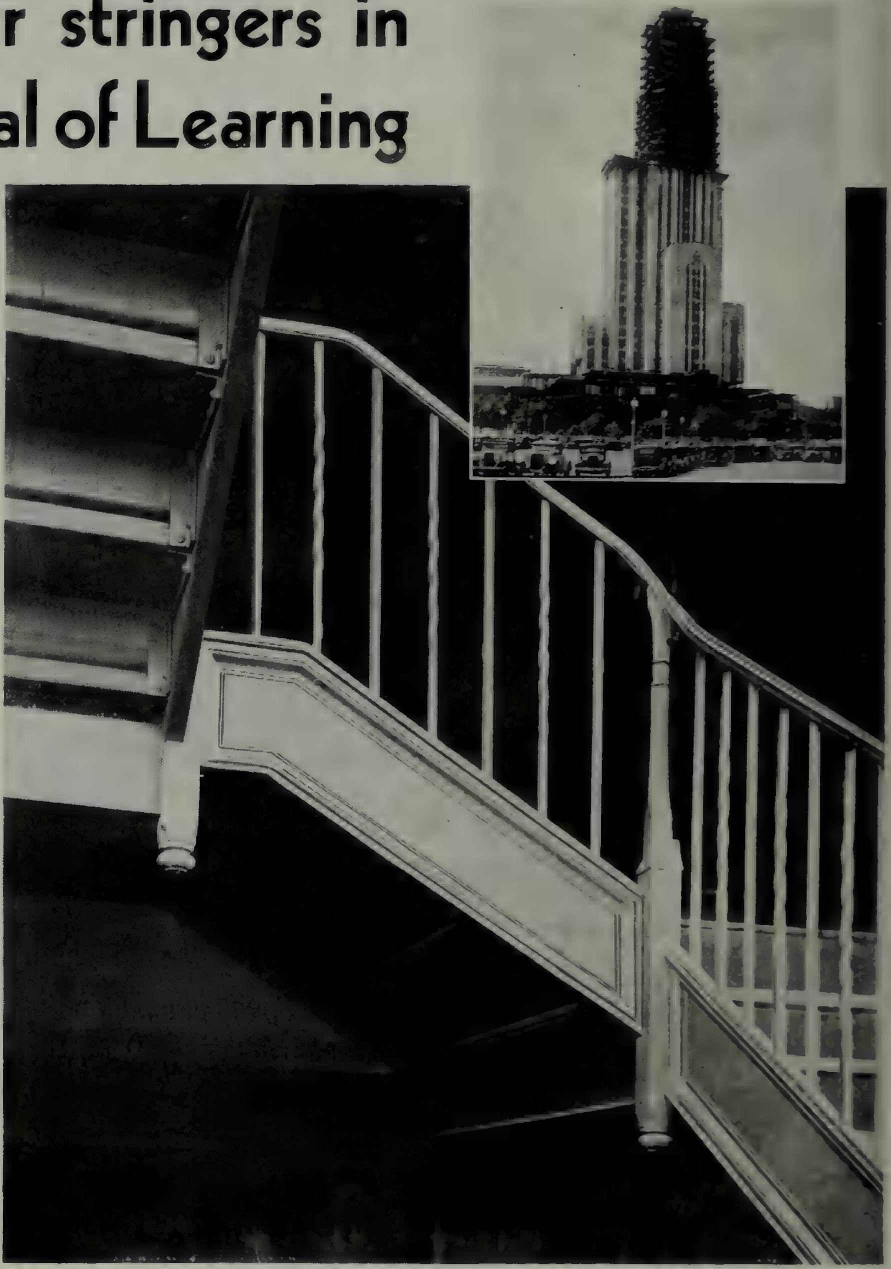

Stairway construction in the Cathedral of Learning, Pittsburgh, Pa.

Architect:
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(Note the neat fitting mitres and the pleasing application of the decorative molding to the J & L Light Weight Channel Stringers.)

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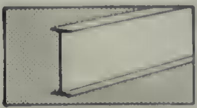

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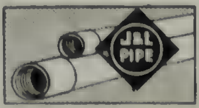

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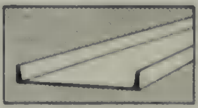

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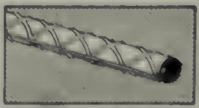

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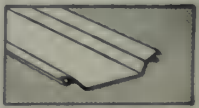

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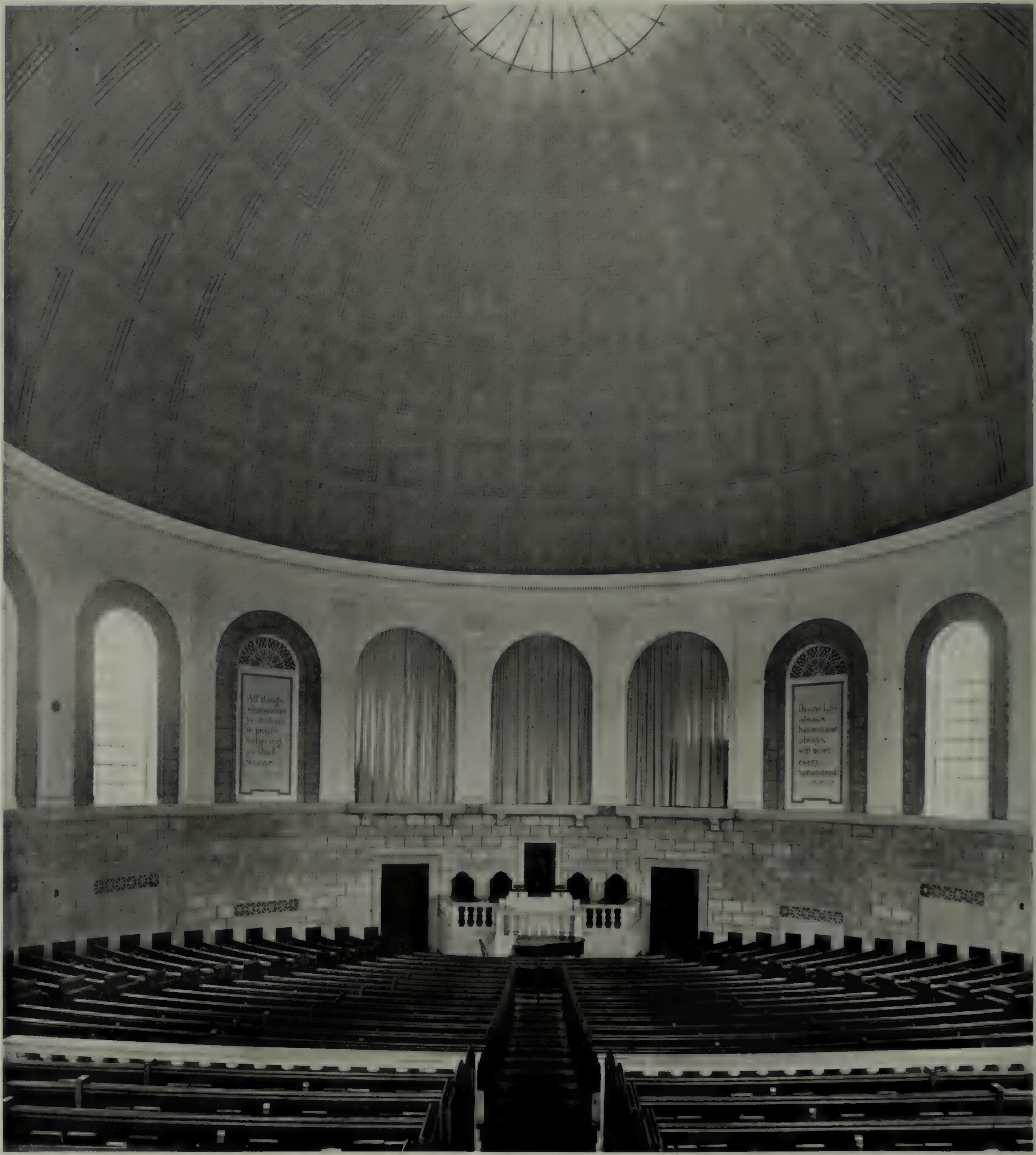

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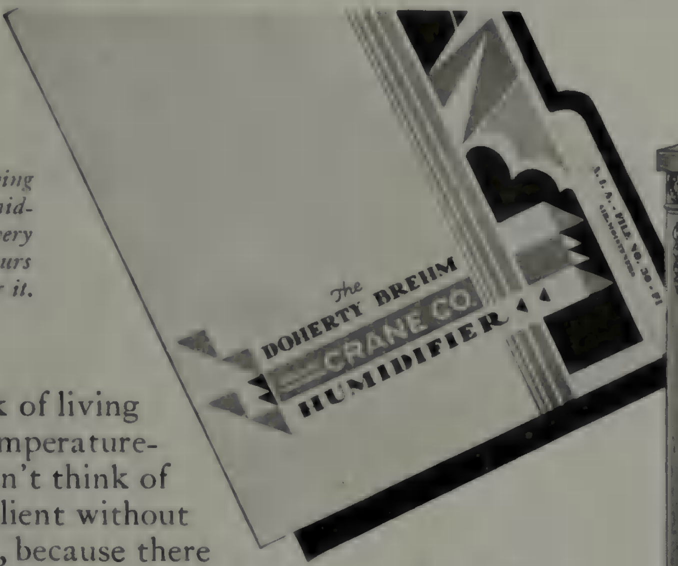

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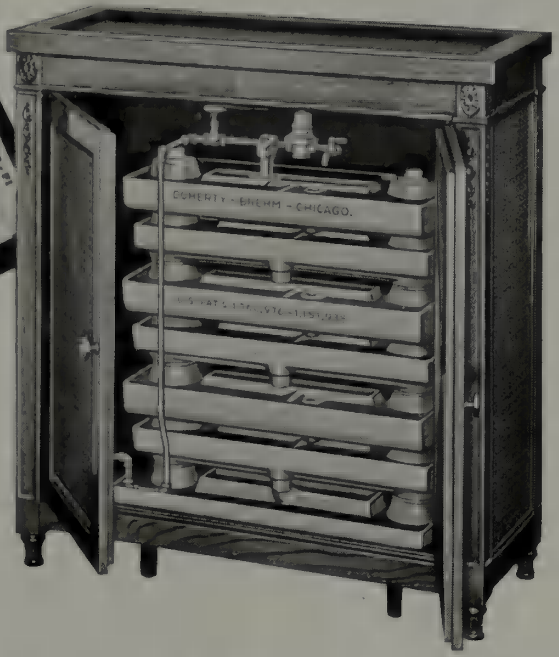

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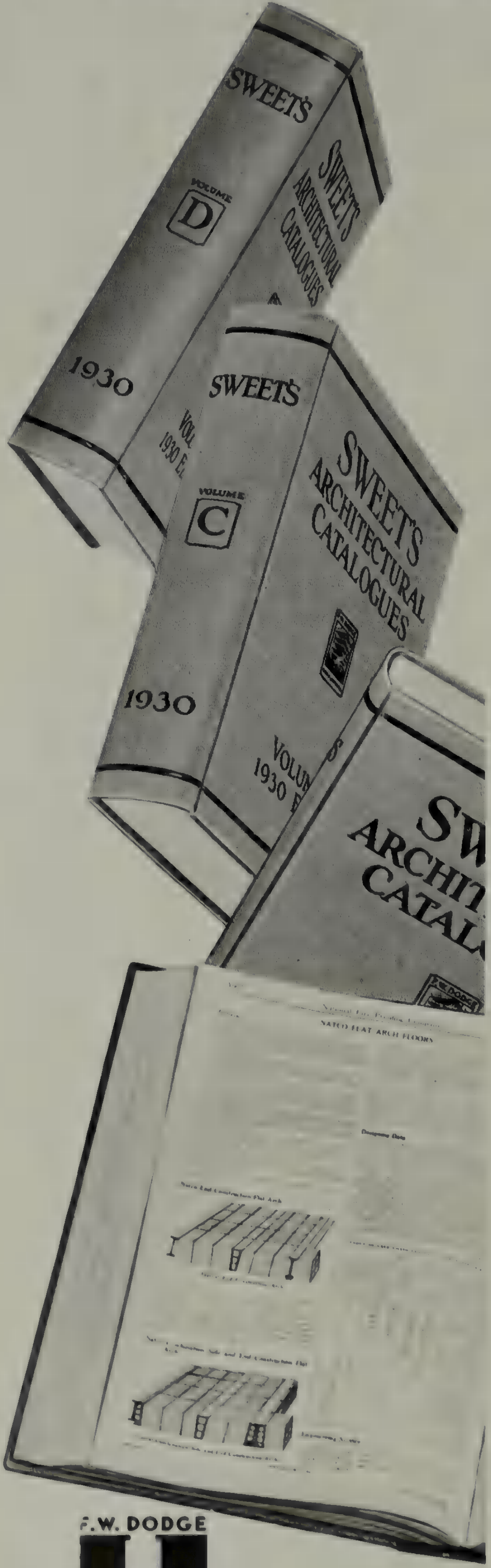

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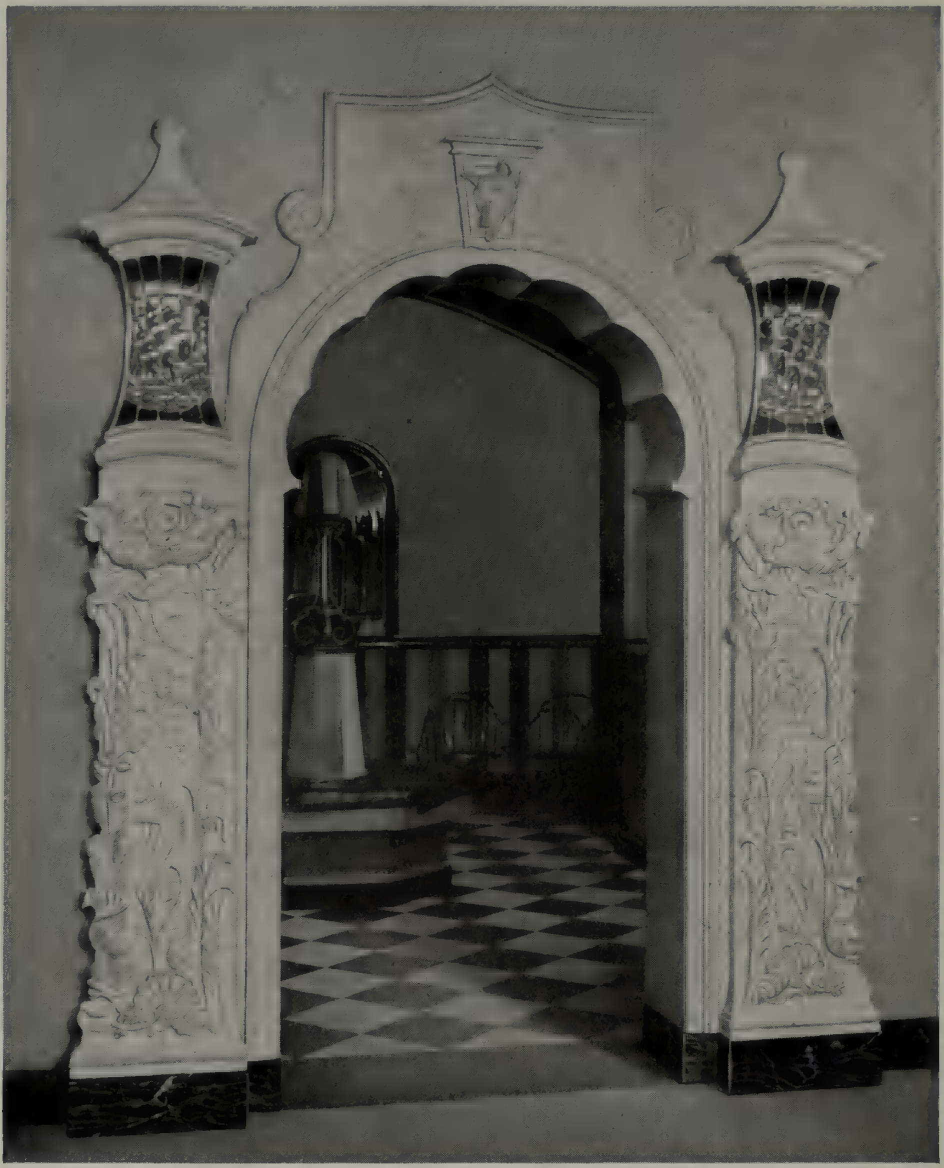

THE MODERNISTIC MOVEMENT

Plate 3

In the Hudson Store, Newcomb-Endicott Building, Detroit, is a children's barber shop known as Circus Land. The design, as created by the architects, Smith, Hinchman & Grylls, is unmistakably modern in character. Only the entrance is shown on this page, but that perhaps is the most unique feature of the interior. This entrance of Roman Travertine is but one part of a very large installation of marble, all of which was finished in our shops.

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appearing monthly in The RECORD is the article in this issue, entitled "Physical Properties of Glass; Permeability to Visible Radiation."

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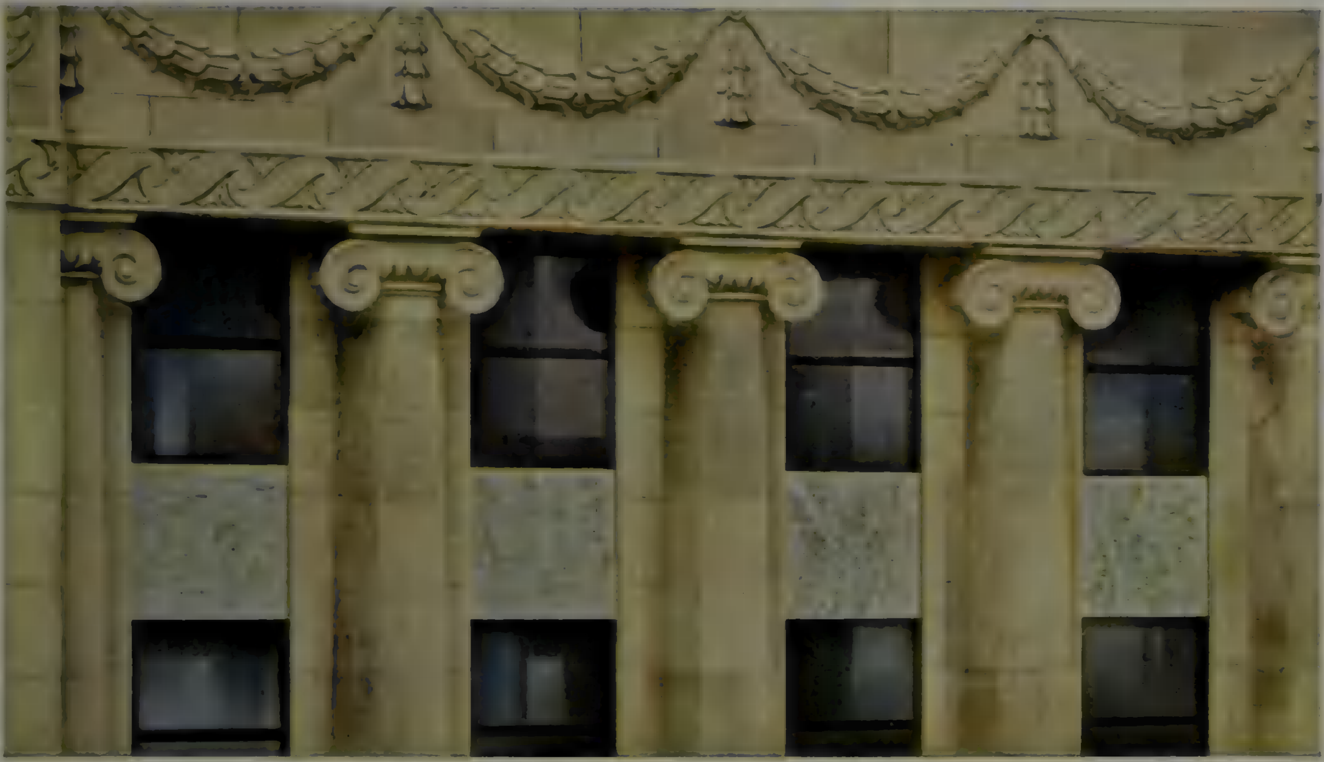

This illustration shows Alberene Stone Spandrels at 33rd floor level of the new Newark & Essex Bank Building, Newark, N. J., *John H. & Wilson C. Ely*, Architects. *Starrett Bros. & Eken, Inc.*, General Contractors

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Details of Alberene Stone Spandrels

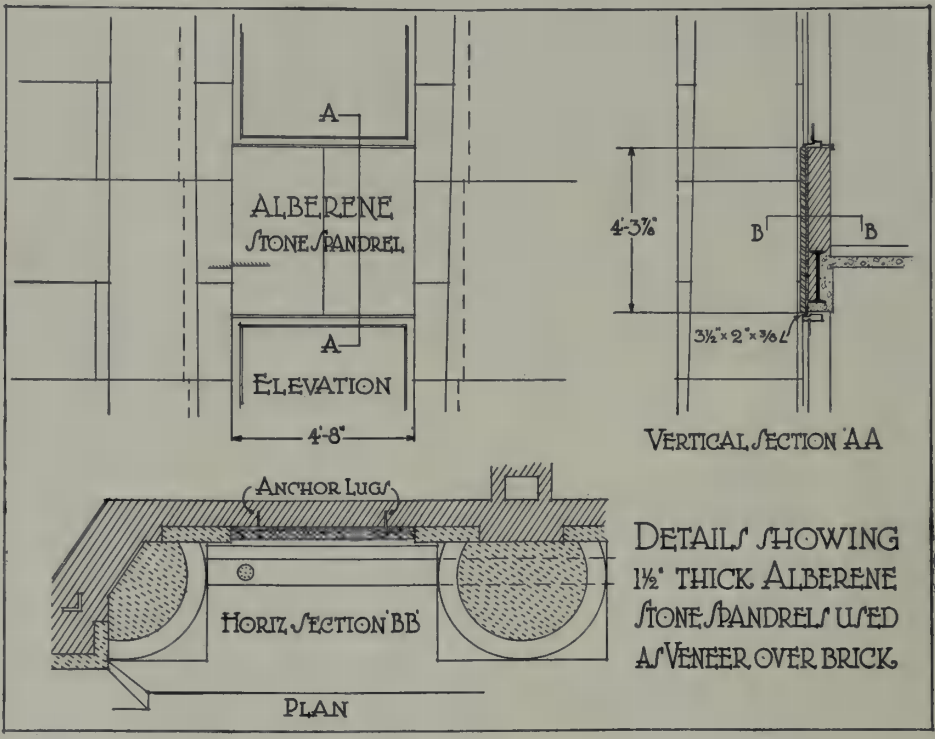

Figure 1. Alberene Stone Spandrels as installed on the 32nd and 33rd floors of the Newark & Essex Bank Building

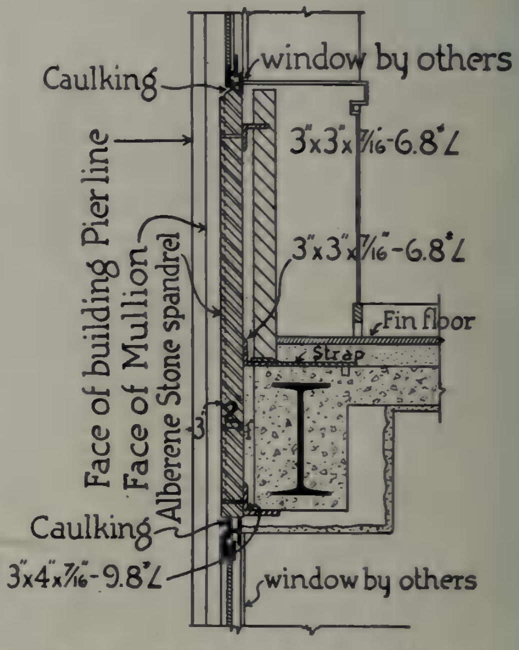

Figure 2. Another installation; in this instance the 1½'' thick Alberene spandrel is backed up with a 2'' brick wall, providing space for radiators to be recessed in the wall.

Information for the Specification Writer on Alberene Stone Spandrels

Figure 1 shows Alberene Stone Spandrels adapted to Single Window construction backed up with a full thickness brick wall. In this instance the Alberene Stone is merely a veneer and is used to provide a color and texture contrast to the limestone. Each spandrel is made up of two slabs (vertical center joint with the veining symmetrically matched. These slabs rest on 3½'' x 2'' x ⅜'' angles and are secured to the wall with anchor straps.

EXTRA FLOOR SPACE

Figure 2 shows how the use of Alberene Stone Spandrels with a 2'' thickness of brick leaves adequate space for radiators to be installed without using valuable floor space. The weight of the wall is also reduced.

Although Alberene Stone was considered first from the standpoint of beauty, the use of Alberene Stone Spandrels offers definite structural advantages as well.

SPECIFICATIONS

Material (*Double Spandrels*). All spandrels to be structurally sound soapstone, grade equal to Alberene Stone. Stone not to be less than 1½" thick at thinnest point. Each pair of spandrels to be securely bolted to three horizontal angles extending 2" beyond spandrel at each end.

Bottom angle to be 3"x4"x 7/16", center and top angles to be 3"x3"x 7/16". Mullion to be 3¾"x3¾" soapstone, rebated and bolted to steel flat 3½"x½".

Construction (*Double Spandrels*). Spandrels to be embedded in masonry 2" on each side, angles extending 2" farther into masonry to provide additional anchorage. Center angle to be bolted to unfinished floor by straps on 16" centers.

(*Single Spandrels*). (a) Spandrels to be embedded in masonry 2" on each side. (b) or, where spandrel is not embedded in masonry at sides it shall rest on 3½"x2"x⅜" angle and be secured to the wall by anchor straps.

Special Cases. Where window is set with deeper reveal than face of spandrel, provide counter sill. Counter sill to be rebated for metal window frame and securely bolted to spandrel. Also provide soffit return for lintel at window head. Soffit to be bolted to under side of the 3"x4"x 7/16" angle.

Note. *Angles are not needed with single spandrel unless of excessive dimensions requiring multiple units. Where space is [illegible] larger than 4'0'' x 4'0'', we recommend the use of single slab rather than built-up spandrels.*

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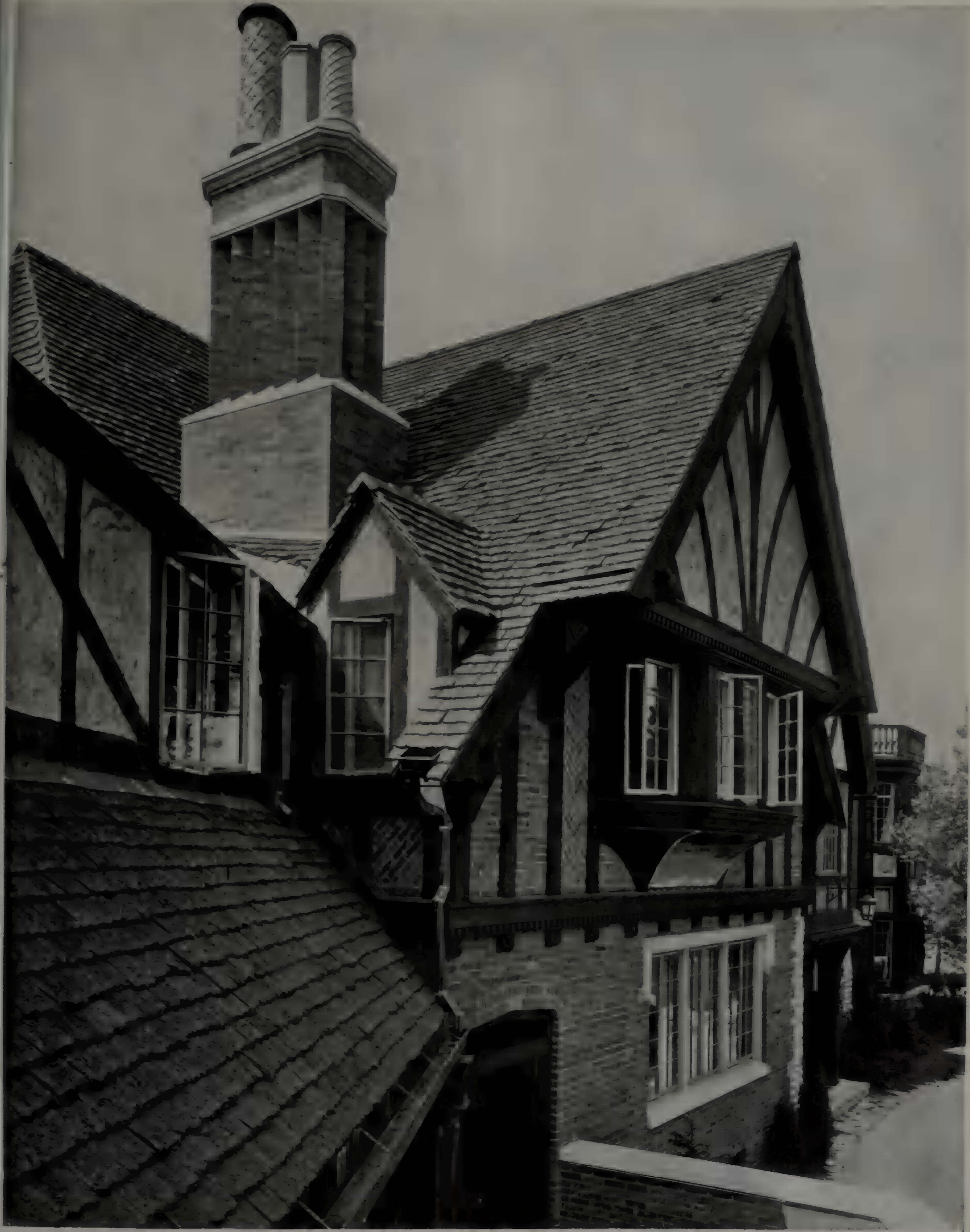

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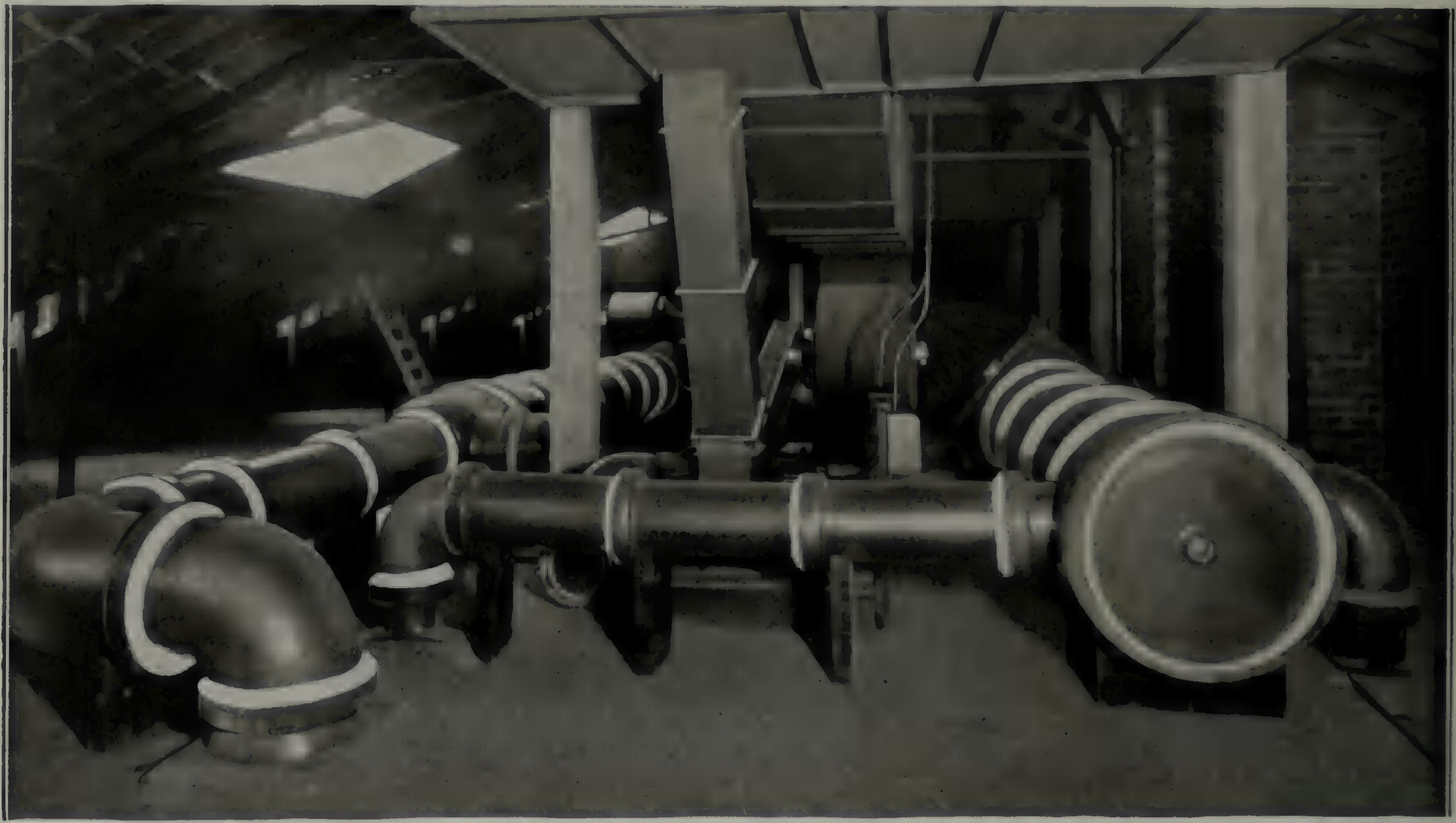

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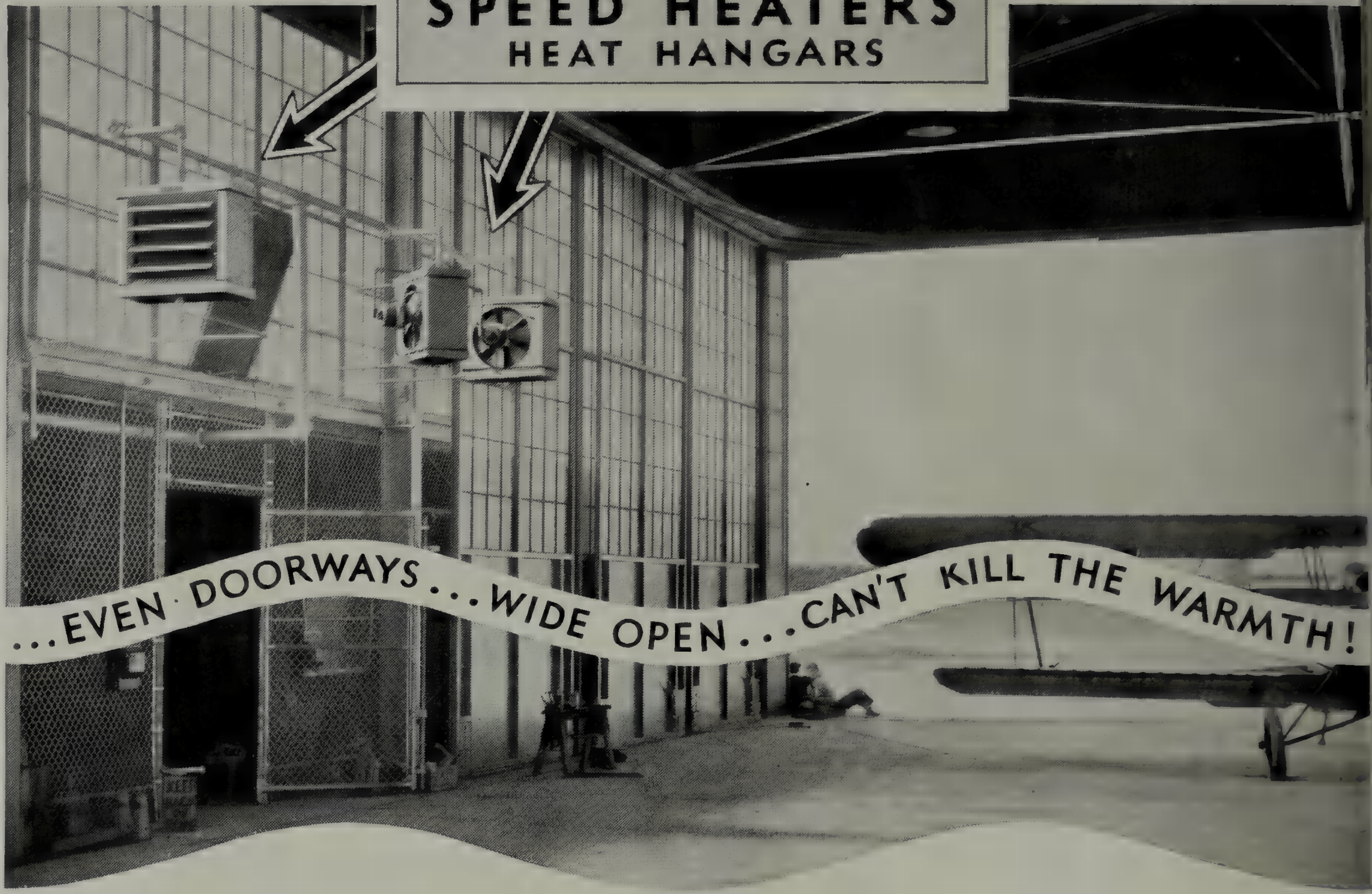

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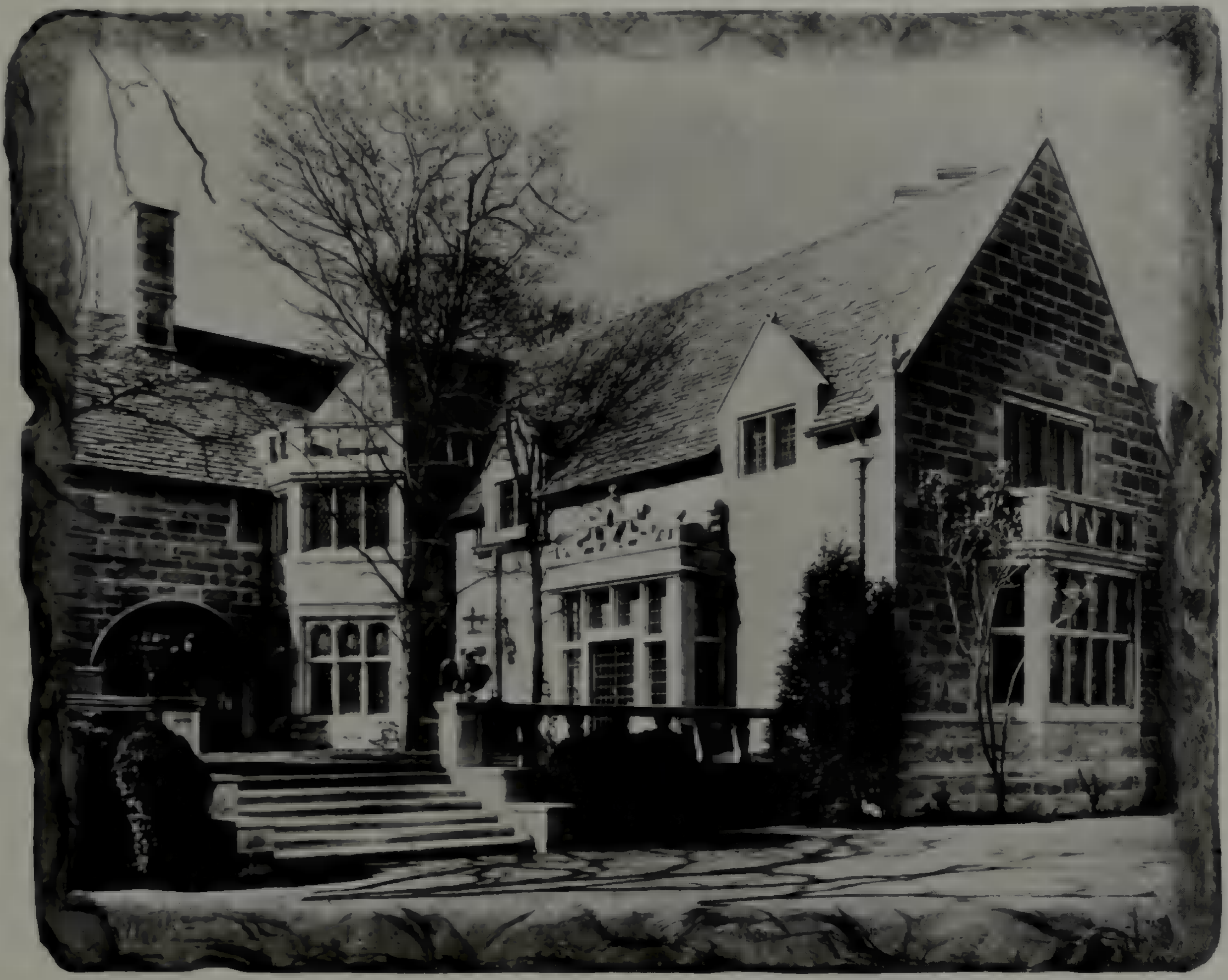

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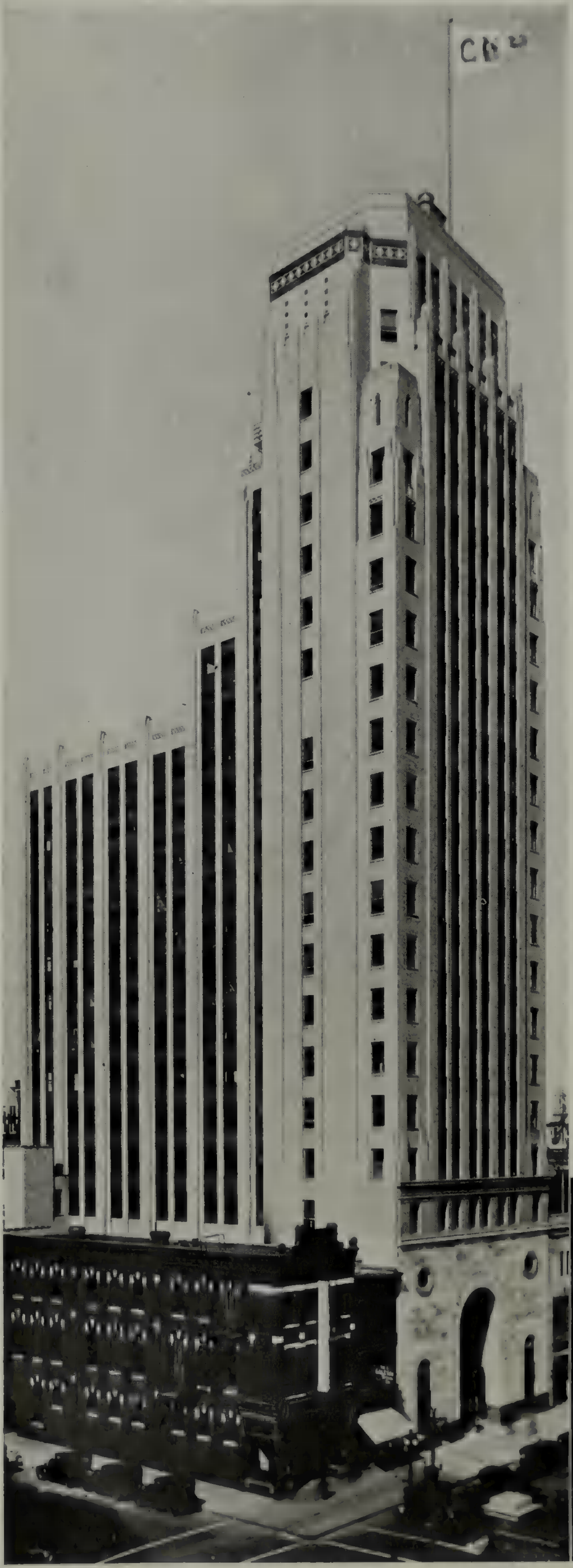

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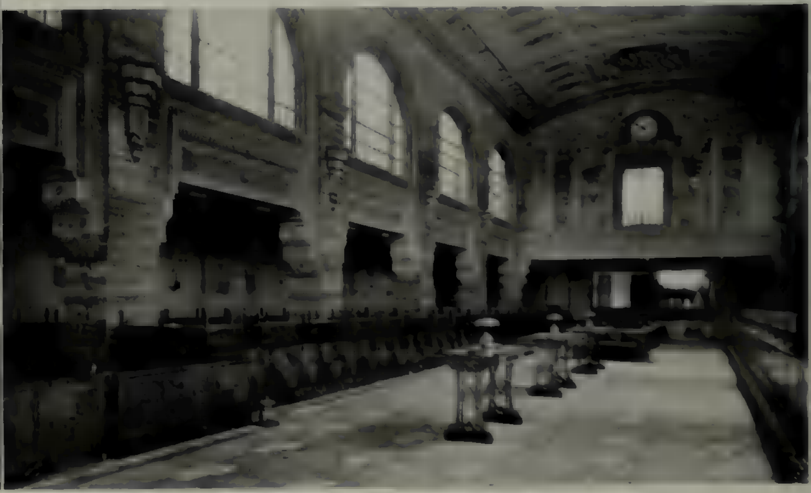

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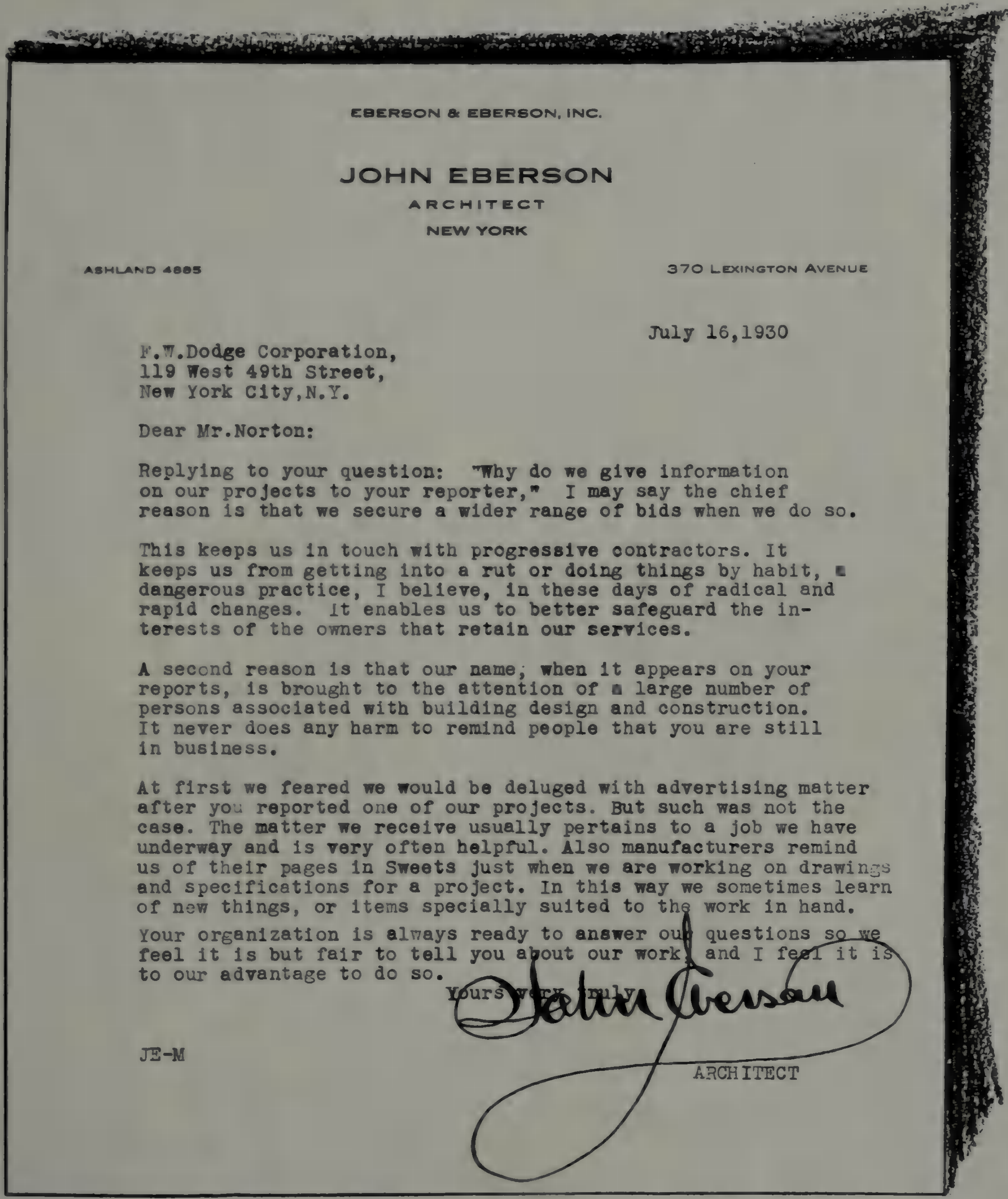

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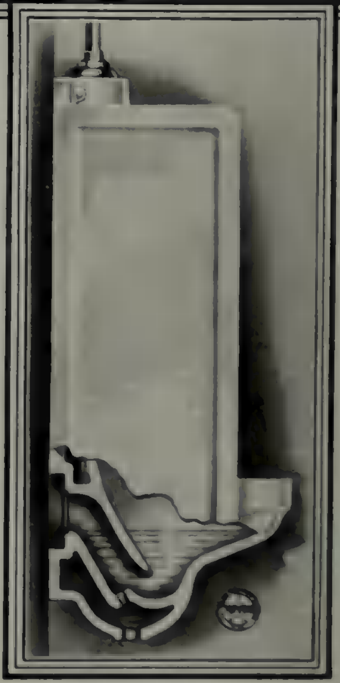

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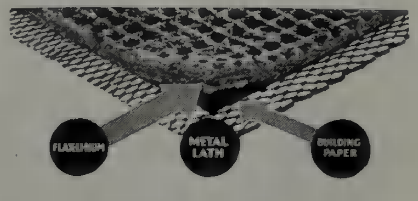

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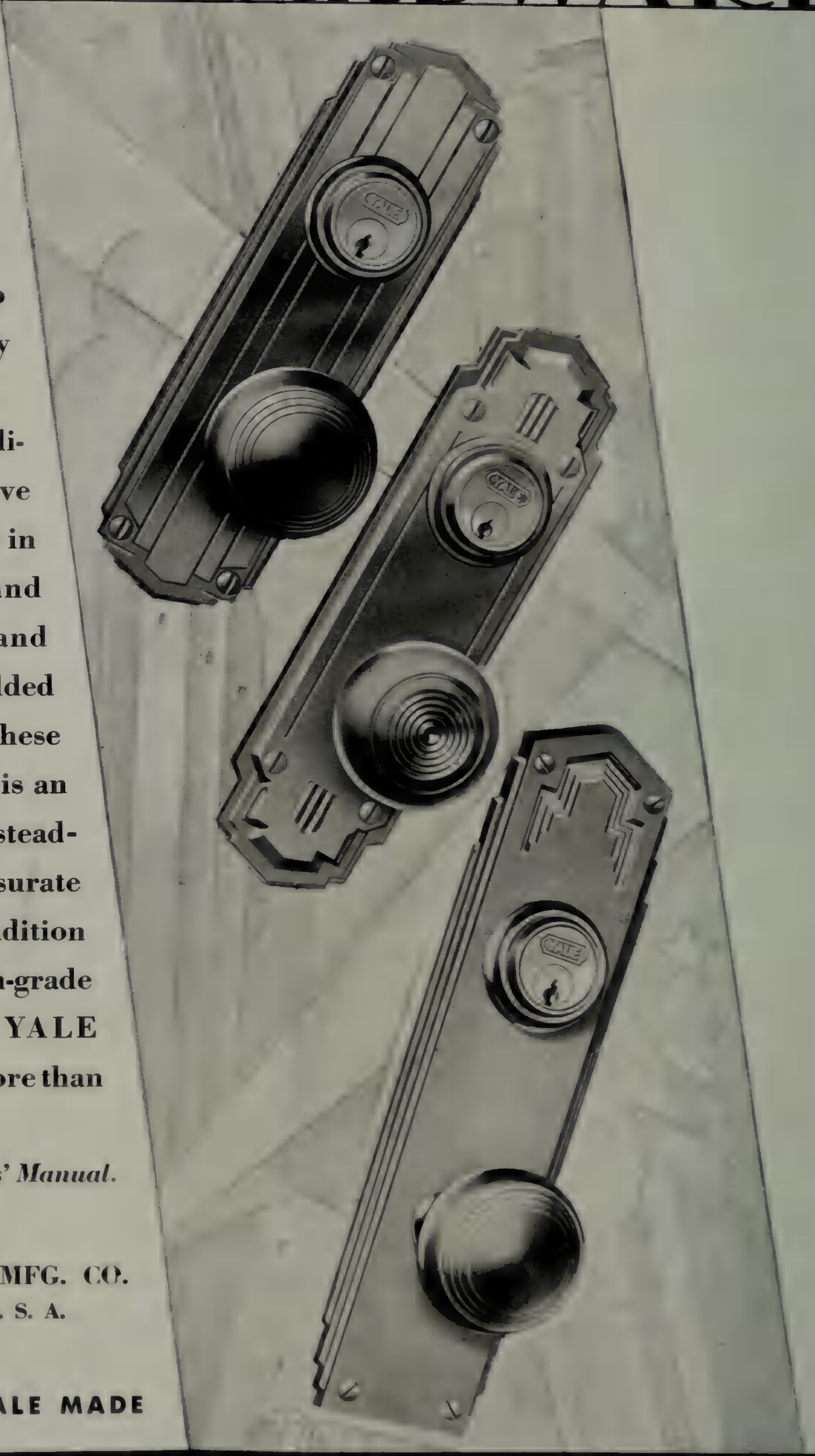

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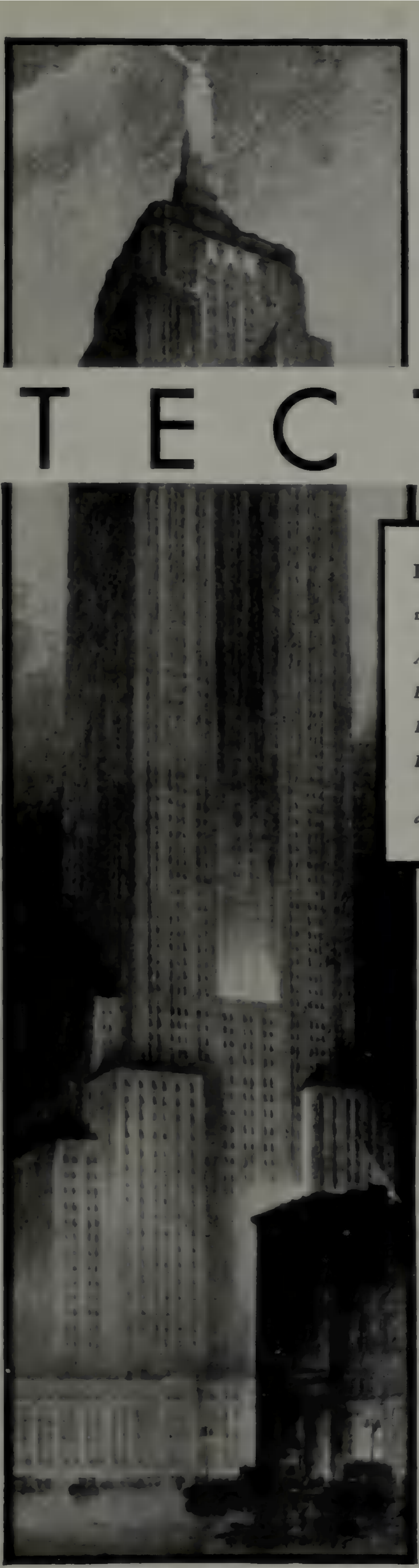

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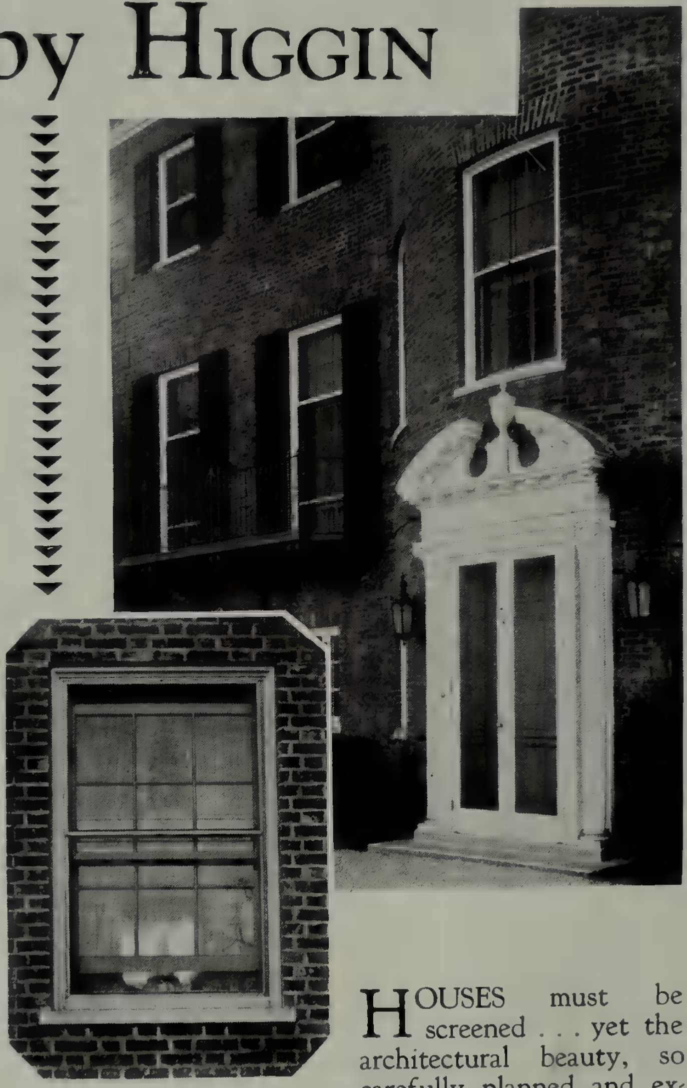

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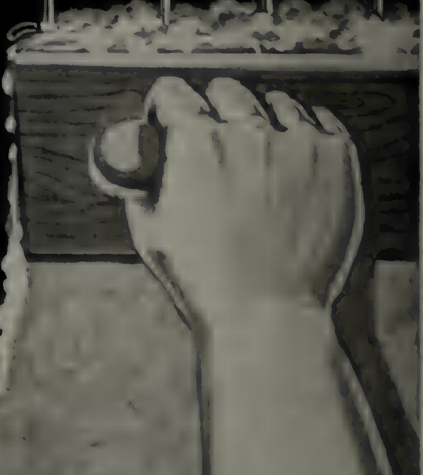

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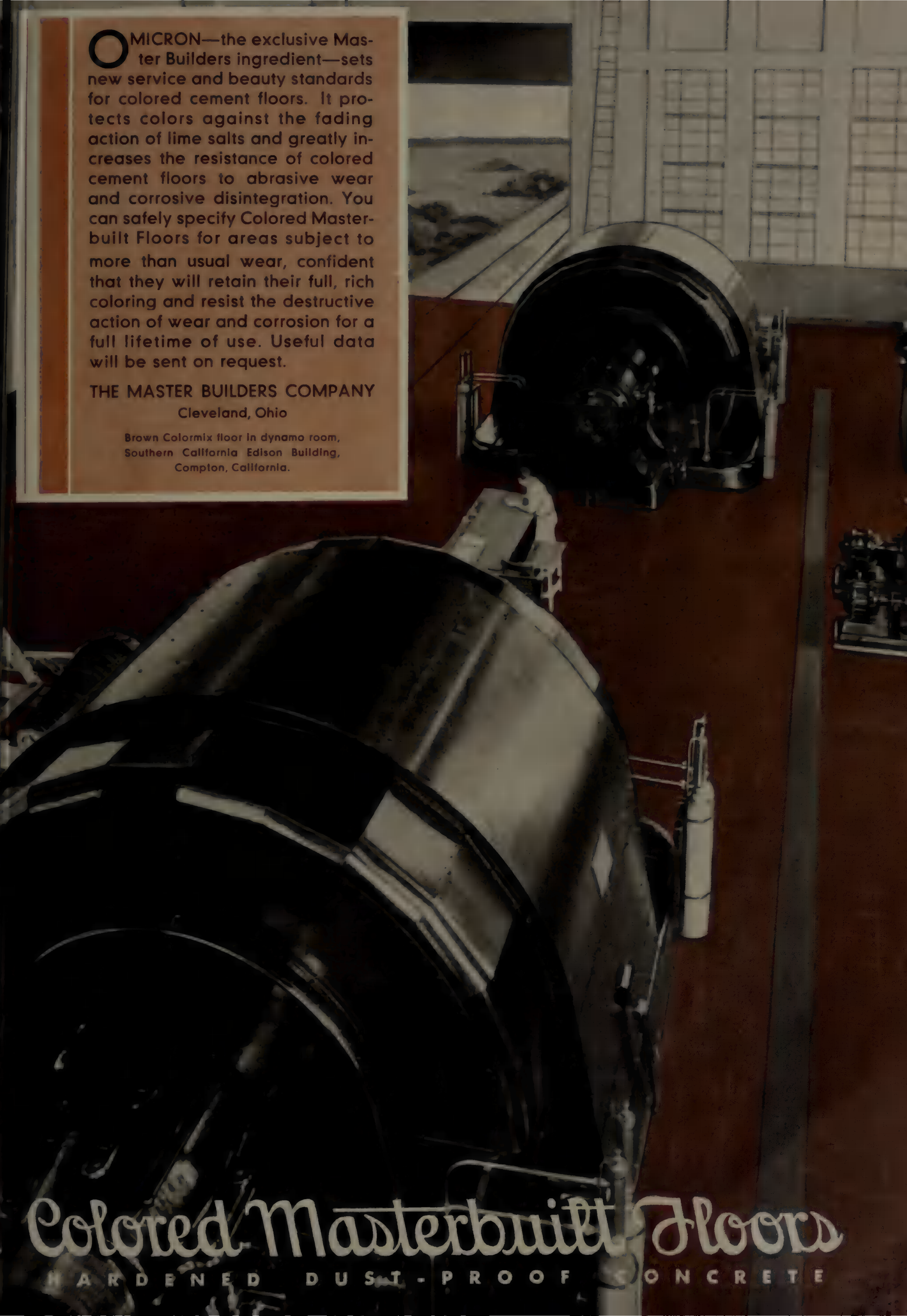

Brown Colormix floor in dynamo room, Southern California Edison Building, Compton, California.

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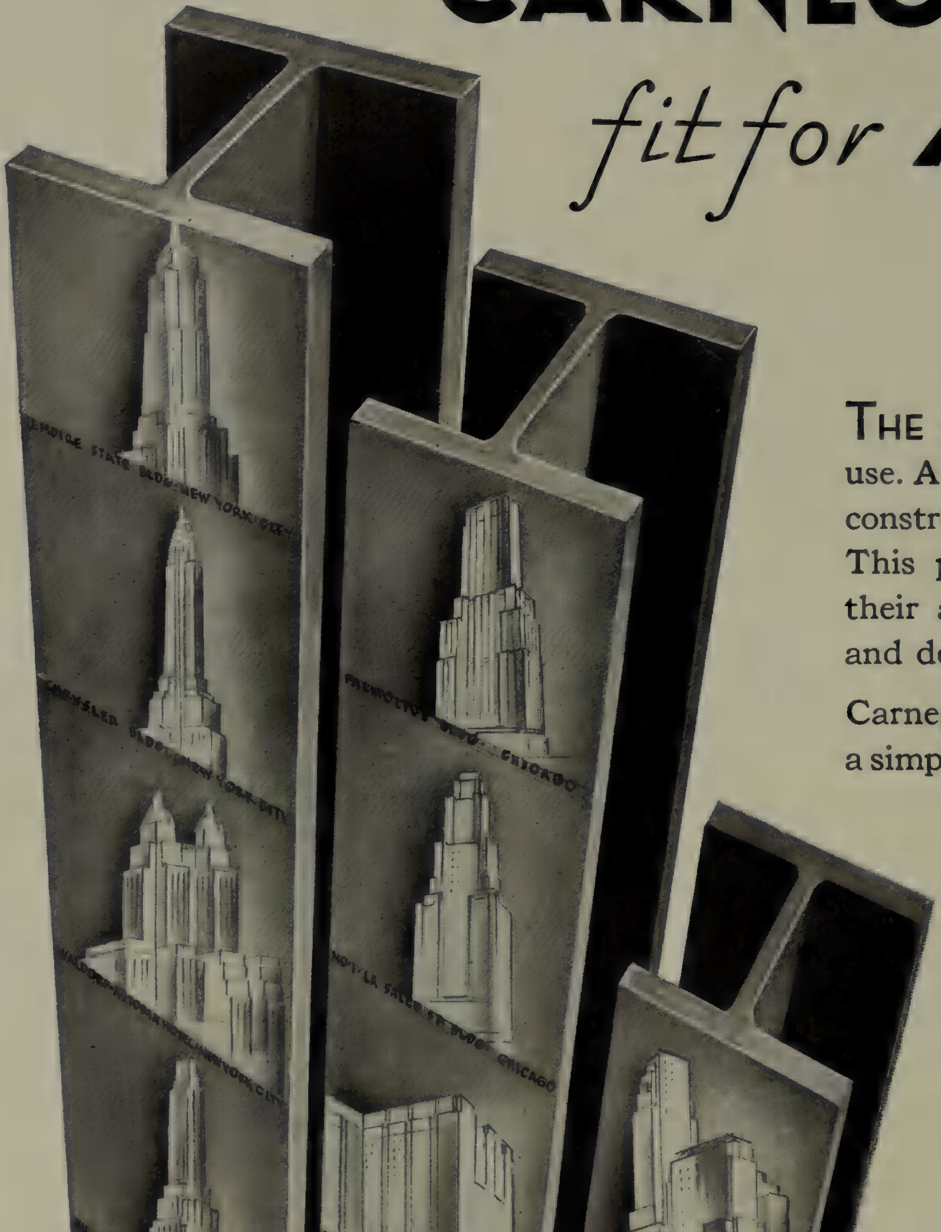
fit for ANY *job*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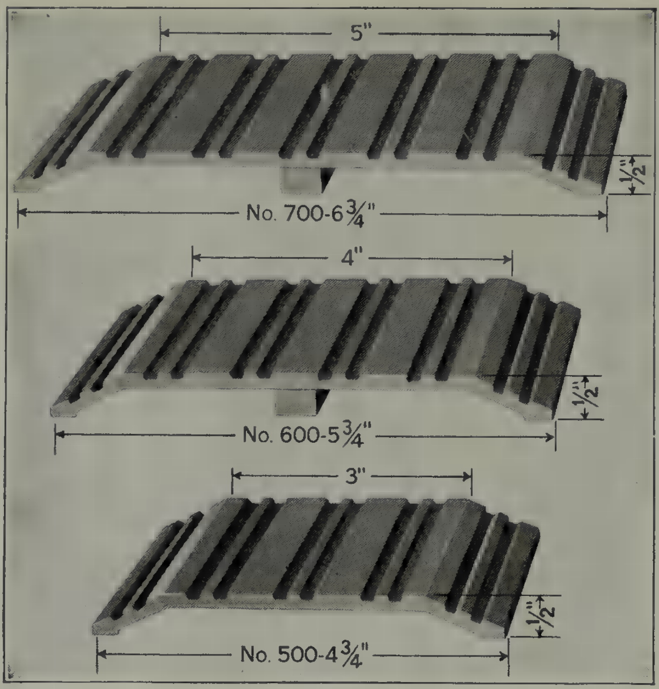

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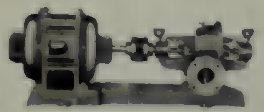

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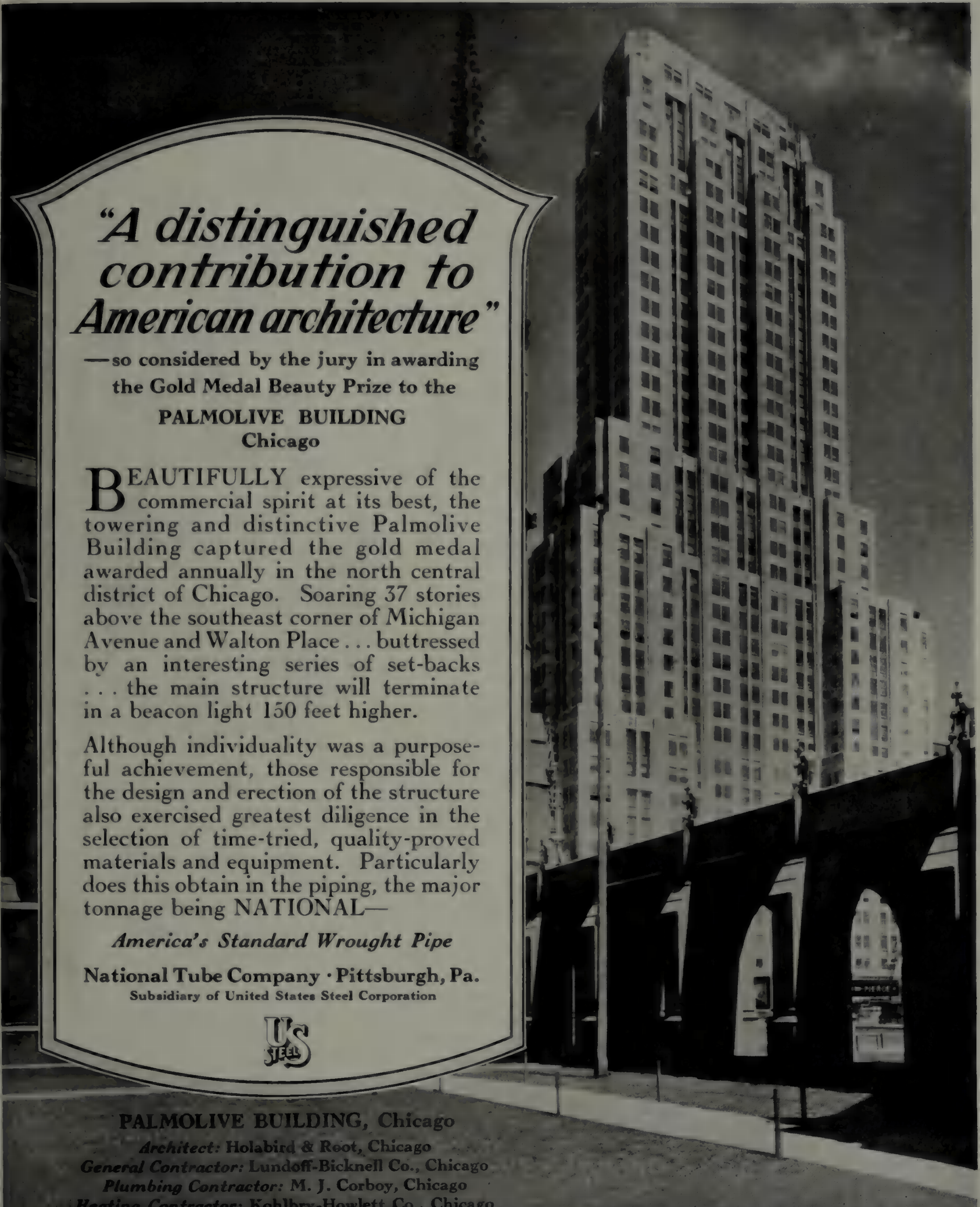

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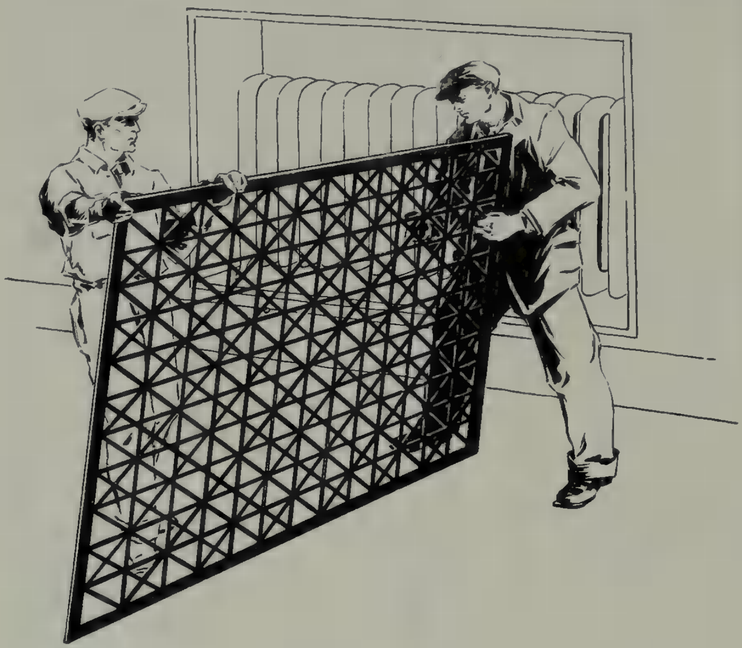

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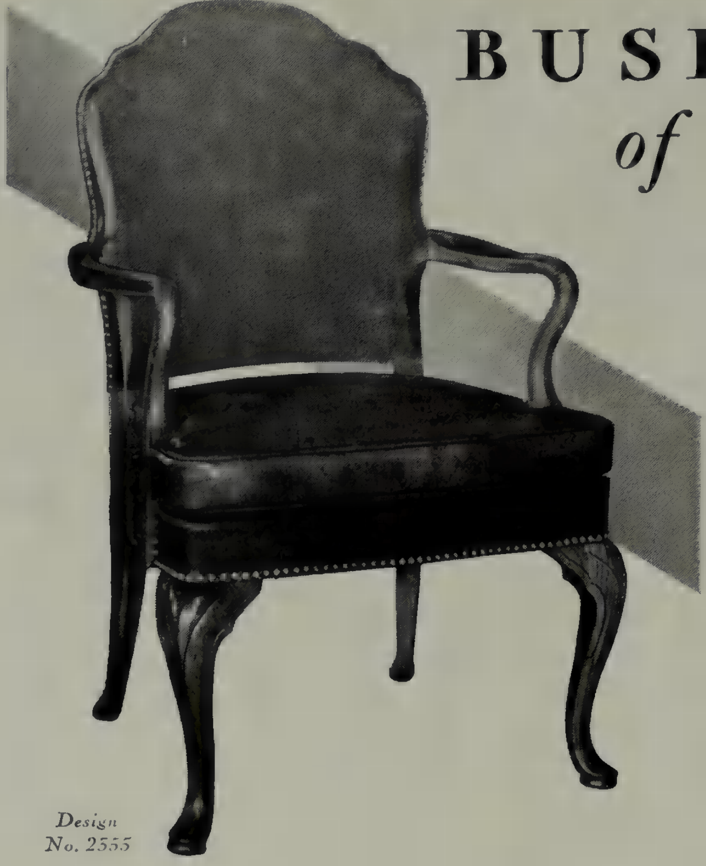

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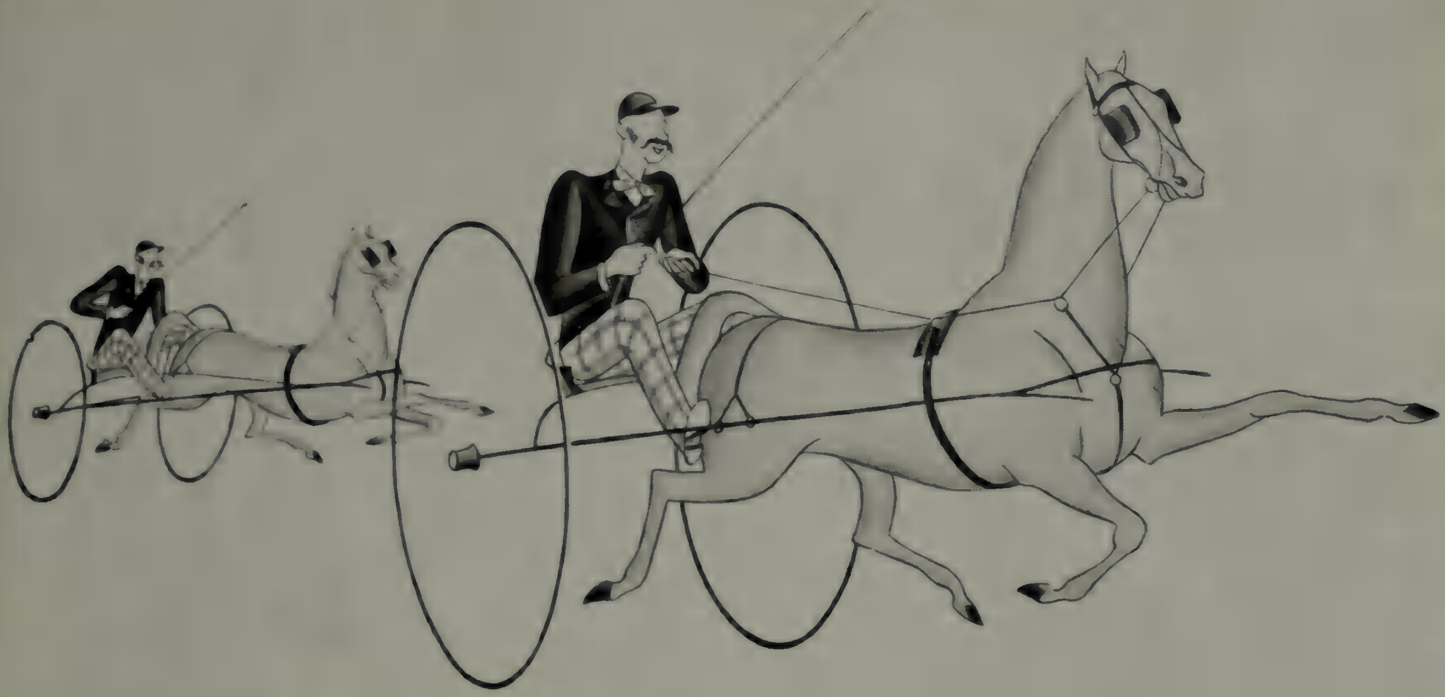

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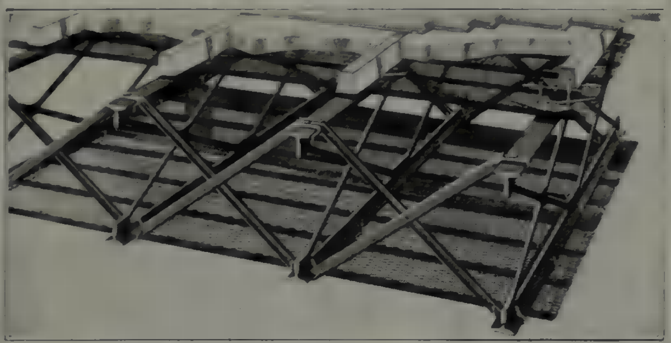

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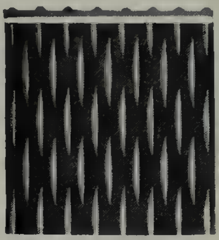

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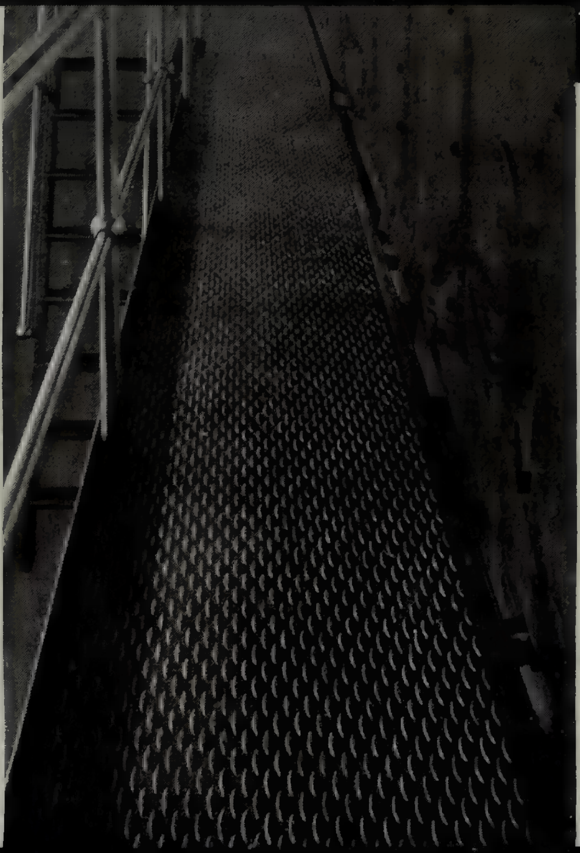

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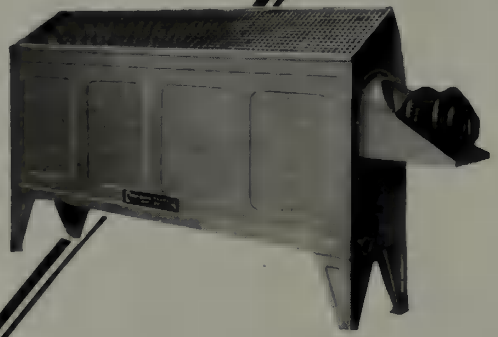

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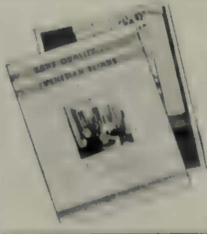

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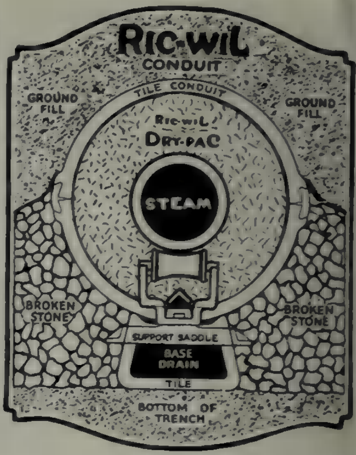
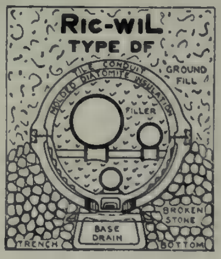


Cross section of Ric-WiL Type F Conduit with Dry-paC filler, single pipe installation. Note Base Drain carries the entire weight of pipe supports and pipe independent of the Conduit.

Top conduit section removed to show Dry-paC after installation. An official test of this underground steam heating line showed an efficiency of better than 94%.

To determine the effect of vibration on Dry-paC, ten feet of 2" pipe was installed in Ric-wiL Type F Conduit and insulated with Dry-paC packed to standard density. One end of the pipe was fitted with a rocker arm which produced a longitudinal movement of $\frac{1}{16}$" 160 times per minute. The pipe was thus vibrated for three 8-hour days—a total of 24 hours or 230,400 vibrations. We believe this pipe movement far exceeded any vibration found in actual installations.



Ric-wiL Type DF Conduit with Dry-paC filler, multiple pipe installation. Type DF has moulded diatomite insulation on inside of conduit.

Top halves of Ric-wiL Conduit were then removed one at a time and the Dry-paC was carefully examined. There was not a sign of settlement and the Dry-paC was just as firm as when first packed. Certainly such a test offers conclusive proof of the efficiency of Dry-paC insulating filler in Ric-wiL Conduit—it is another reason why so many Ric-wiL installations, insulated with Dry-paC, show better then 90% efficiency.

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the
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kitchen
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The day is at hand when many home economics authorities and homemakers agree that no kitchen can be considered a strictly modern kitchen unless it has an electric dishwasher.

CONOVER Electric DISHWASHER SINK

It washes » rinses » dries

APPROVED
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Good Housekeeping Institute, Delineator Home Institute, chemical, mechanical and electrical engineers, bacteriologists and thousands of homemakers.

Architects who specify the CONOVER Electric Dishwasher Sink in new homes and apartments, or when modernizing old ones, are going to increase very substantially the resale and renting values of the buildings thus equipped.

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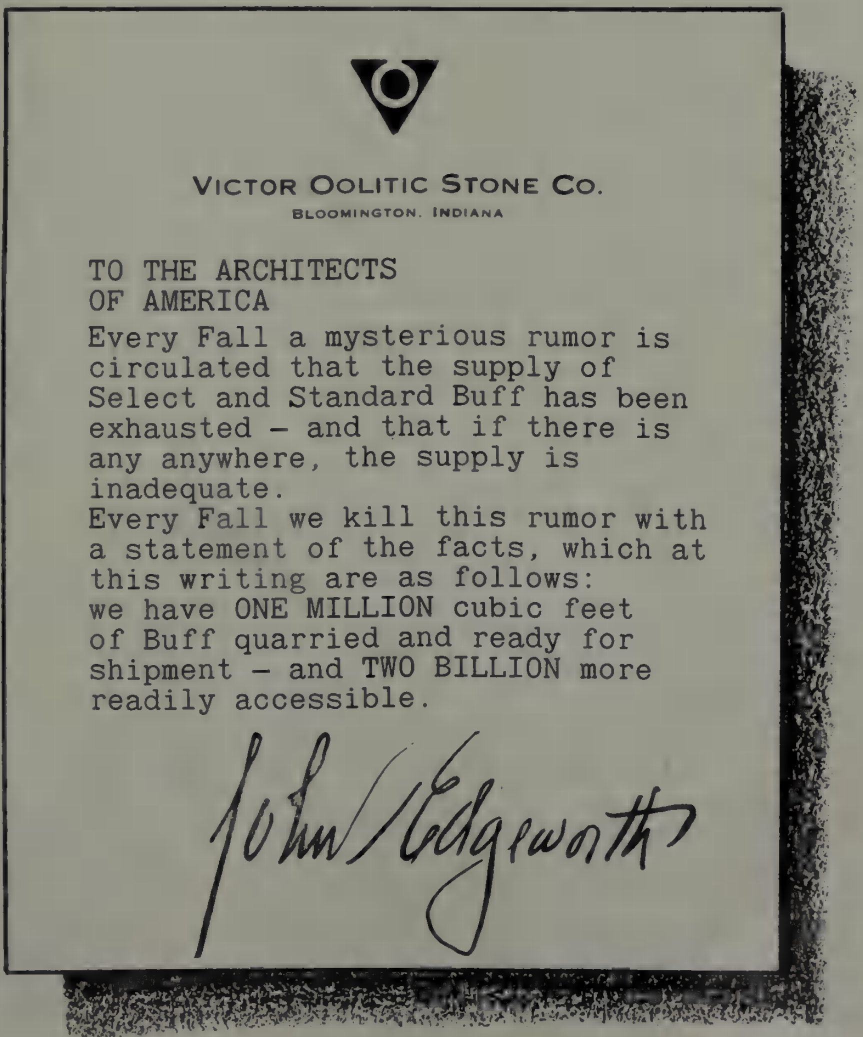

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TO REBUILD
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Top View—The Building Showing Parapet Partially Removed
Lower View—Tearing down the leaky Parapet

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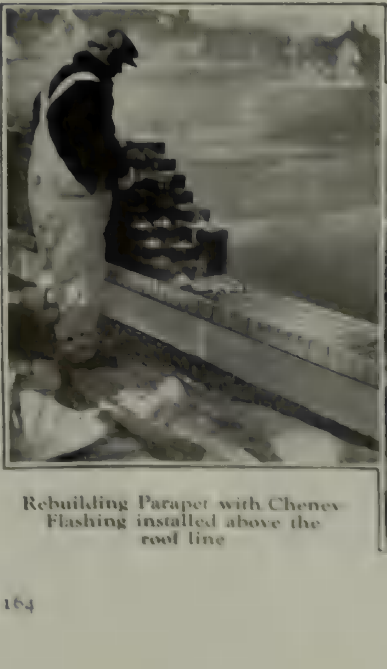

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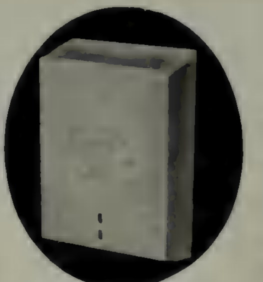

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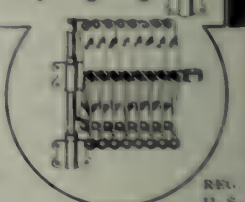

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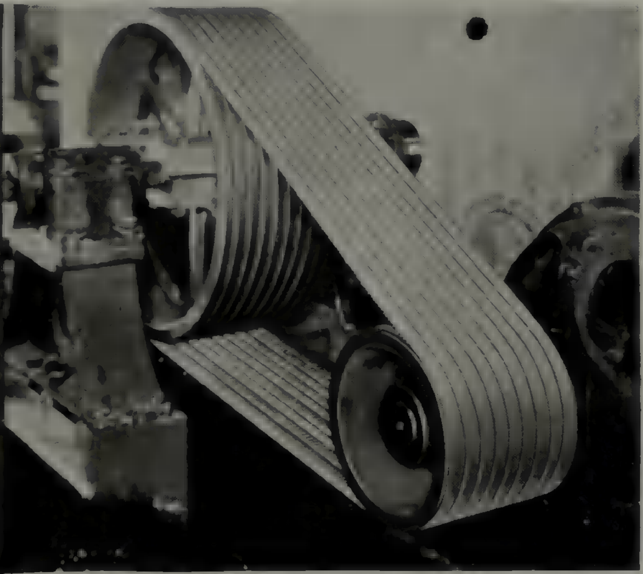

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COG-BELT DRIVES

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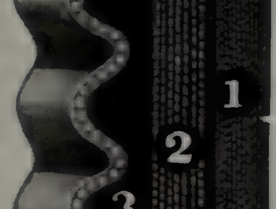

Cross Sectional View

① The outer section gives balance. Composed of numerous layers of vulcanized, strong bias-cut cord fabric. Bias-cut to accommodate bending without strain or distortion. This is another reason why Daytons don't heat and last longer than other belts.

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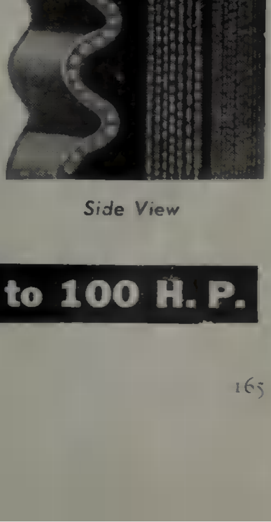

Side View

Complete Drives—Pulleys and Belts—in stock—all ratios 2 H. P. to 100 H. P.

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Catalog 30

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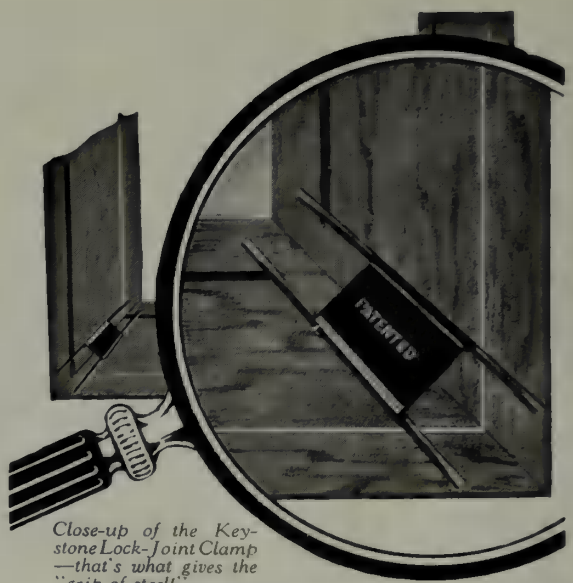

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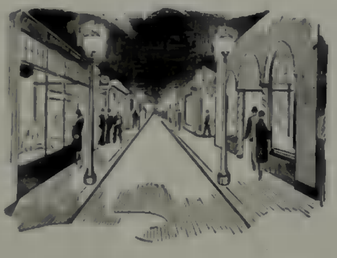

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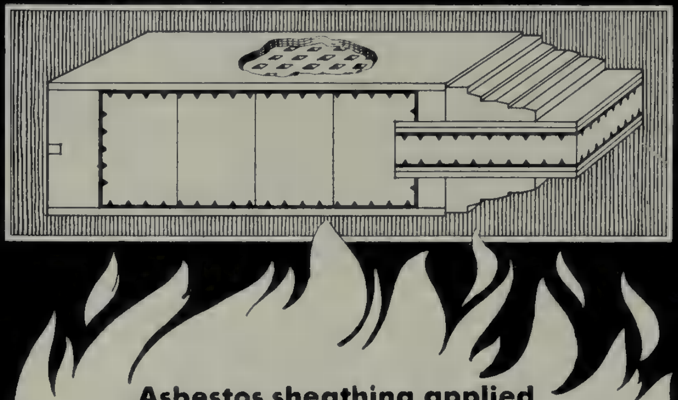

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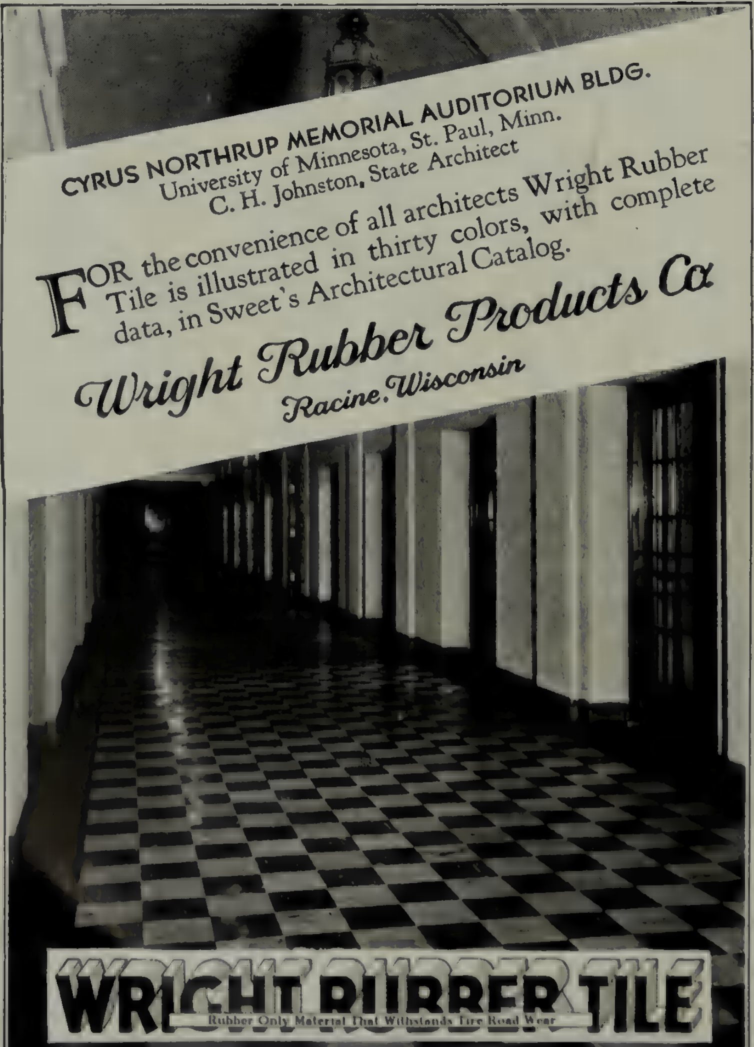

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Rubber Only Material That Withstands Fire Road Wear

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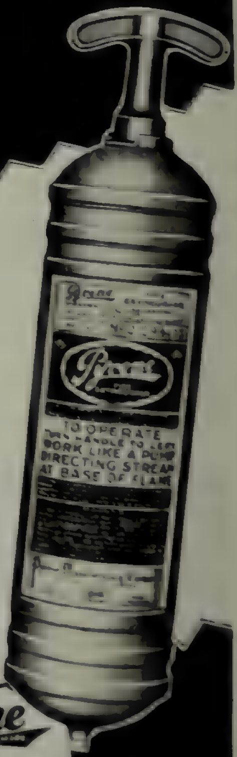

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To the man who admires good craftsmanship, there is great satisfaction in things that are made as strong as men know how to make them; there is something close to exaltation in the feeling of sheer strength, of durability, of dependability. Here is something that will LAST!

Sweet's
Pages C3130-C3135

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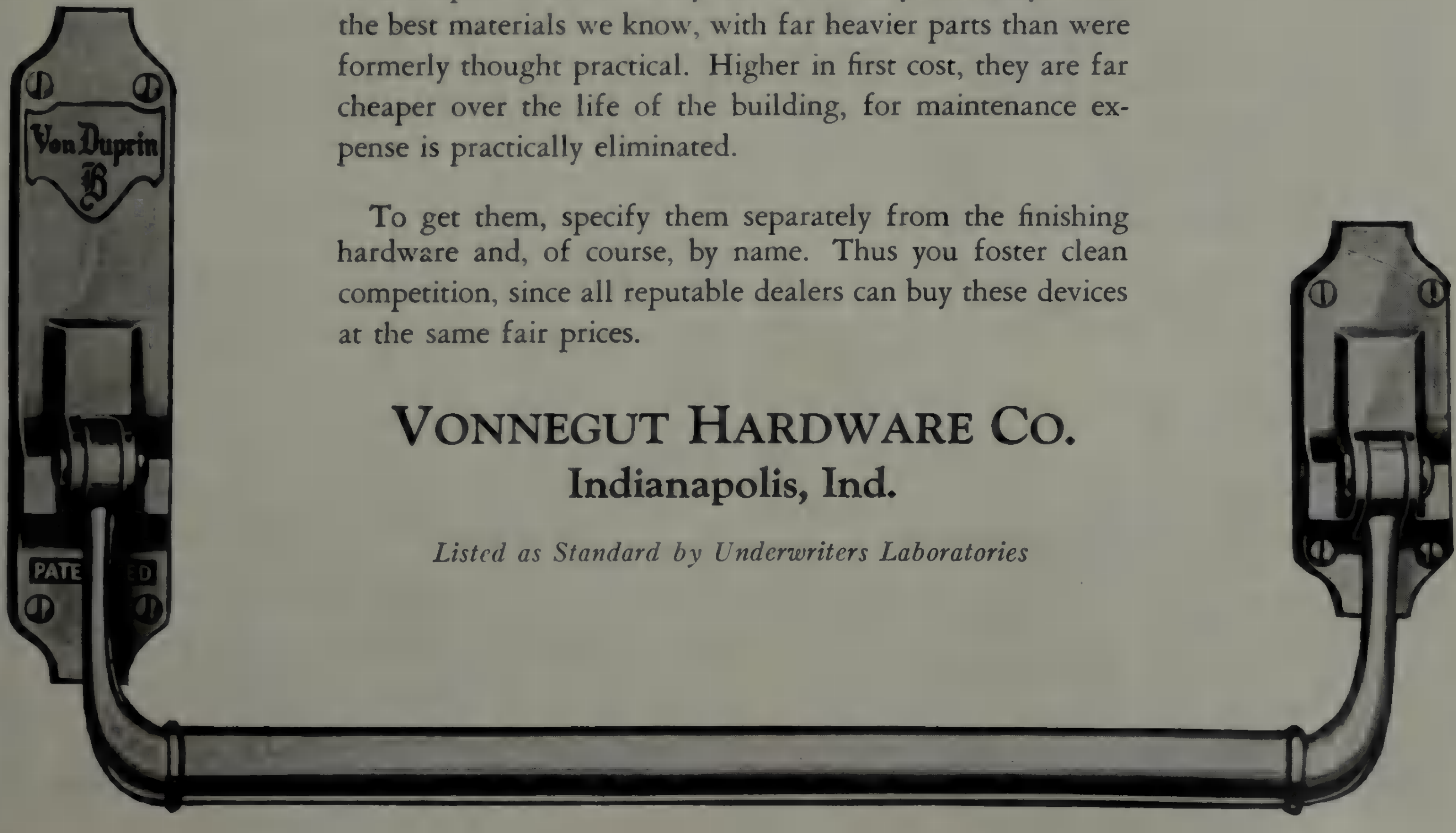

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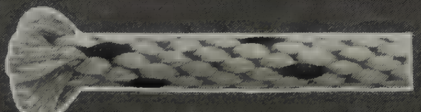
SAMSON SPOT
SASH CORD



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MADE of extra quality stock, carefully inspected, and guaranteed free from imperfections of braid or finish. No adulteration to increase weight and decrease wear.

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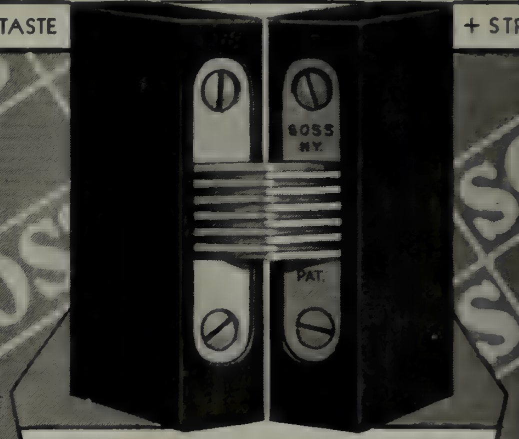

"BEAUTY WITHOUT INTERRUPTION"

COMPLETELY invisible when the door is closed. Flush doors - clean lines - no undesirable projections.

Manufactured with scientific precision as befits a quality product - yet surprisingly low in cost.

There is a Soss Invisible Hinge for every purpose. See our line in Sweet's Catalogue "D" or write direct to us for our own complete catalogue.

Suggestions for Uses:

House Doors
Folding Partitions
Secret Panels
Radiator Covers
Folding Tables
Music Cabinets

Established 1908
SOSS MANUFACTURING CO., Inc
Roselle, New Jersey
DETROIT OFFICE:
1051 Book Building
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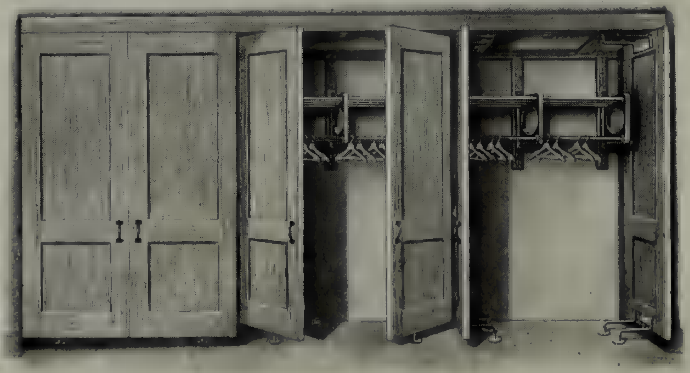
SOSS INVISIBLE HINGES



Evans "Vanishing Door" Wardrobe Class A-A, without jambs or trim

HERE is an ideal school class-room wardrobe, low in cost yet meeting every demand of the most exacting. This wardrobe is made for plaster ends, backs, and ceilings: no jambs nor trim being required. When so desired blackboards can be furnished for the doors, giving a continuous blackboard surface.

The "Vanishing Door" hinges on which the doors are hung are made with double pivoted arms and swing the doors back into the wardrobe entirely out of the way. There are no noisy tracks nor rollers to stick or bind, nor intricate mechanism to get out of order. These hinges are guaranteed to last as long as the building.

All wardrobes are furnished complete in the knockdown, with all woodwork cut to size, and only need to be secured in place. The hinges are easier to put on than common butt hinges. The entire cost of installation is small.

Many types of school wardrobes are fully illustrated, described and detailed in Catalog "K". This catalog is of A. I. A. file size and can be had for the asking.

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Washington, Indiana, U. S. A.
VANISHING DOOR WARDROBES

WE WILL PAY
25 CENTS EACH
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THESE BACK COPIES

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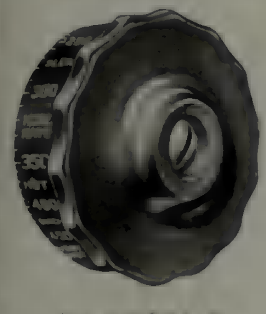
We will pay transportation charges if copies are received by October 25, 1930

THE ARCHITECTURAL RECORD
119 West 40th Street
New York City



It Is a GOOD Gas Range That Has This Red Wheel

Patents Pending

TIFFIN Model CASH PRICE $\$99^{\underline{75}}$ ($112.75 West of the Rockies)

The TIFFIN Model . . . .

A new Magic Chef at a lower price

WOMAN'S desire for a modern and beautiful kitchen won universal response to the beauty appeal of the MAGIC CHEF first announced a year ago. Now a new MAGIC CHEF . . . the TIFFIN . . . in a more compact and convenient size . . . has been created which makes MAGIC CHEF charm and style available to the builder at a substantially lower price.

The Tiffin Model of the MAGIC CHEF is delightfully modern in design, daintily harmonious in color scheme, charming and graceful as a piece of fine furniture, yet built so conveniently compact that it will fit the smaller kitchen and be in perfect keeping with its proportions.

Like the larger MAGIC CHEF models, the new Tiffin is beautifully enameled throughout. The exterior finish is in Old Ivory with Verd Antique marble trim. The handles are of cool, onyx green bakelite mounted on chromium finished fittings that will not tarnish. A new type folding cover conceals the cooking top, giving a smooth, clean appearance to the stove when not in use.

With all its attractive style the Tiffin is thoroughly serviceable and complete with the modern MAGIC CHEF features including the famous Lorain (Red Wheel) Oven Heat Regulator, the Insulated Oven and Broiler, the Safety-Type Valves, the reversible, rackless Broiler Pan and the roomy Service Drawer.

MAGIC CHEF is sold by dealers and gas companies wherever gas is available. It can also be used in non-gas-served territories with tank gas service. Write for full information.

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PATRICIAN Model CASH PRICE $\$195^{\underline{00}}$ ($210 West of the Rockies)

Send name and address for free copy of booklet showing modern kitchens.

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PRODUCT OF
AMERICAN STOVE COMPANY

AMERICAN STOVE COMPANY . . . DEPT. B, 555 CHOUTEAU AVENUE, ST. LOUIS, MO.

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REEVESHIRE CLEFT CHESTNUT FENCE

. . . . *for the Suburban Home*

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Cleft Chestnut Fencing is reasonably priced because it is machine made. Of live, split chestnut palings, spaced one inch apart, it has a quaint dignity and is particularly adapted to the suburban home.

Imported in rolls 16′ long, in five heights, 10′, 8′, 6′6″, 4′11″ and 3′10″. The 10′ height is especially suitable for tennis court enclosures.

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Bridgeport, Connecticut

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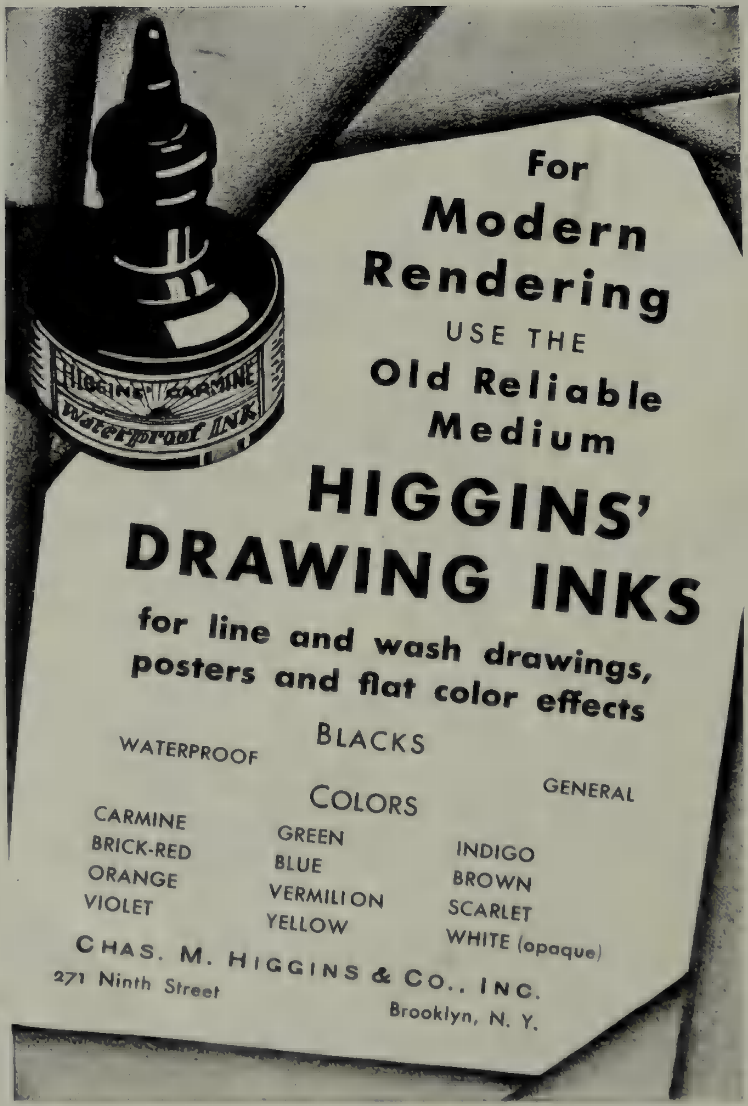

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Our Complete Catalogue is in Sweet's
for 1930 . . . . Pages D4438-4453

THE CHARLES PARKER COMPANY

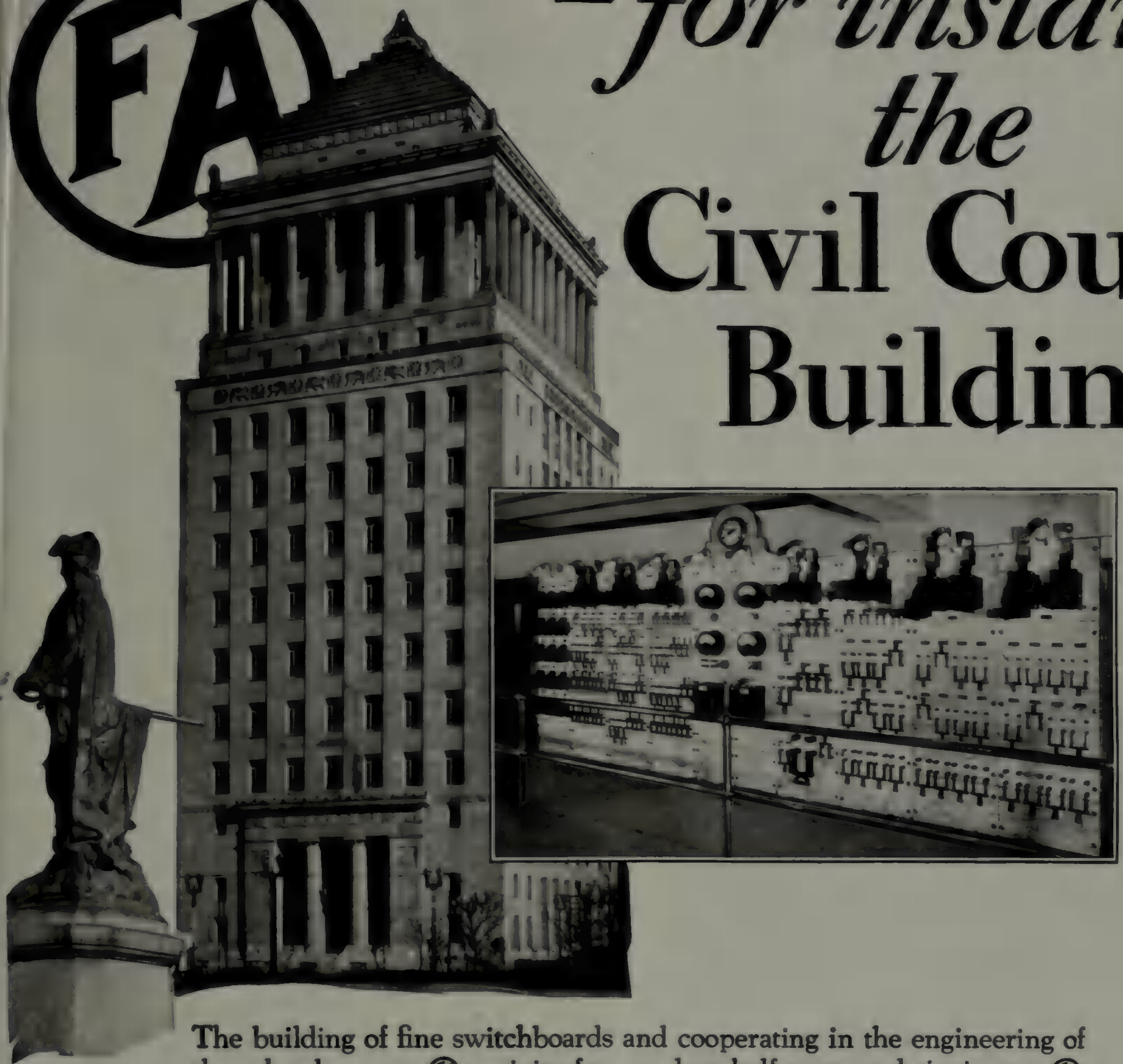
ESTABLISHED 1832

Manufacturers of Bathroom Furnishings

MERIDEN, CONN.

New York Office....CHARLES PARKER CO., Inc. 25 MURRAY STREET

—for instance the Civil Courts Building



Civil Courts Building, St. Louis, Mo.
The Plaza Commission, Inc., Architects
E. A. Koeneman Electric Co., St. Louis Elect. Cont.

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Architects, Holabird and Root

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RUSTLESS METAL STORE FRONTS, WINDOWS and DOORS
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CLASSIFIED DIRECTORY OF ADVERTISERS

Alphabetical Index to Advertisers, Page 192

After reviewing advertisements in this issue—use Sweet's Architectural Catalogues for 1930 for catalogue and specification information on the products of the most of the manufacturers.

Acid Proof Chemical Stoneware
Knight, Maurice A.

Acoustics
Armstrong Cork & Insulation Co.
Boston Acoustical Eng. Division of Housing Company
Guastavino, R., Co.
Johns-Manville Corp.
U. S. Gypsum Co.

Air Conditioner
American Blower Co.
Buffalo Forge Co.
Doherty-Brehm Co.
Lewis Corporation

Air Washer
Buffalo Forge Co.

Aluminum
Aluminum Co. of America

Arc Welding—Lincoln Electric Co.

Architectural Supplies
Higgins, Chas. M., & Co.

Artstone—Rackle, George, & Sons Co.

Asbestos—Johns-Manville Corporation

Basement, Windows—Steel
Detroit Steel Products Co.
Truscon Steel Company

Bathroom Accessories
Parker Charles Company

Beads—Corner Metal
Milcor Steel Co.
Truscon Steel Company
Wheeling Corrugating Co.

Beams, Angles, Channels, Etc.
Bethlehem Steel Co.
Carnegie Steel Company
Jones & Laughlin Steel Corp.

Belts—Dayton Rubber Mfg. Co.

Blackboards—Weber Costello Co.

Boilers—American Gas Products Co.
American Radiator Co.
Dahlquist Mfg. Co.
Heggie-Simplex Boiler Co.
Pierce, Butler & Pierce Mfg. Co.
Smith, H. B., Company, The, Inc.
Titusville Iron Work Co.
Wood Gar Engineering Co.

Bolts—Door—Corbin, P. & F.

Brass and Bronze
See "Ornamental Metal"

Brick—Finzer Bros. Clay Co.

Bridges—Steel—American Bridge Co.
Bethlehem Steel Co.

Building Paper
Angier Corporation
Natural Steel Fabric Co.

Buildings—Steel
Carnegie Steel Company
Nat'l Assoc. of Flat Rolled Steel Mfrs.

Butts—Corbin, P. & F.
Stanley Works

Cabinet Work—Hyde-Murphy Co.

Cabinets—Kitchen
Olean Metal Cabinet Works, Inc.

Cabinets—Medicine—Parker Charles Company

Cabinets—Toilet Paper
Victoria Paper Mills Co.

Casement Operators—Rixson, Oscar C., Company

Casements—Bayley, William, Co.
Crittall Casement Window Co.
Detroit Steel Products Co.
International Casement Co.
Mesker Bros. Iron Company
Truscon Steel Company

Cast Stone
Cast Stone Institute

Cellar Drainer
Penberthy Injector Co.

Cement—Louisville Cement Company
Medusa Portland Cement Co.
Portland Cement Association
Universal Atlas Cement Co.

Cement White
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Chain Sash—American Chain Co., Inc.
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Chairs—Marble, B. L., Chair Co.

Channels—Carnegie Steel Co.
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Landis Eng. & Mfg. Co.

Columns, Porches, Etc.
Hartmann-Sanders Co.
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Concrete Construction—Reinforced
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Sonneborn, L., Sons, Incorporated
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Ric-wiL Company

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Fretz-Moon Tube Co.
Garland Mfg. Co.

Conduo-Base
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Congoleum-Nairn, Inc.

Corkboard
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Dishwasher—Electric
Conover Company

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Norton Door Closer Co.
Sargent & Company

Door and Window Frames
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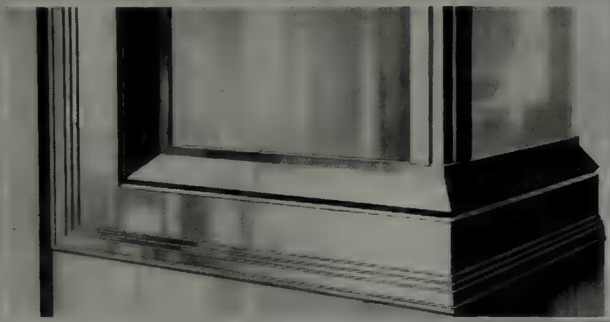

DETAIL OF KAWNEER "B" CONSTRUCTION

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Kawneer
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NILES, MICHIGAN, Subsidiary, BERKELEY, CALIFORNIA
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There are many types and styles of R-S Fountains; they are now available in colors and all have the R-S Vertico Slant feature. Let us give you full particulars. Write for catalog.

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    Weis, Henry, Mfg. Co.
    Wilson, J. G., Corp.
    Zouri Co., The

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    American District Tel. Co.
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    Security Fire Door Co.
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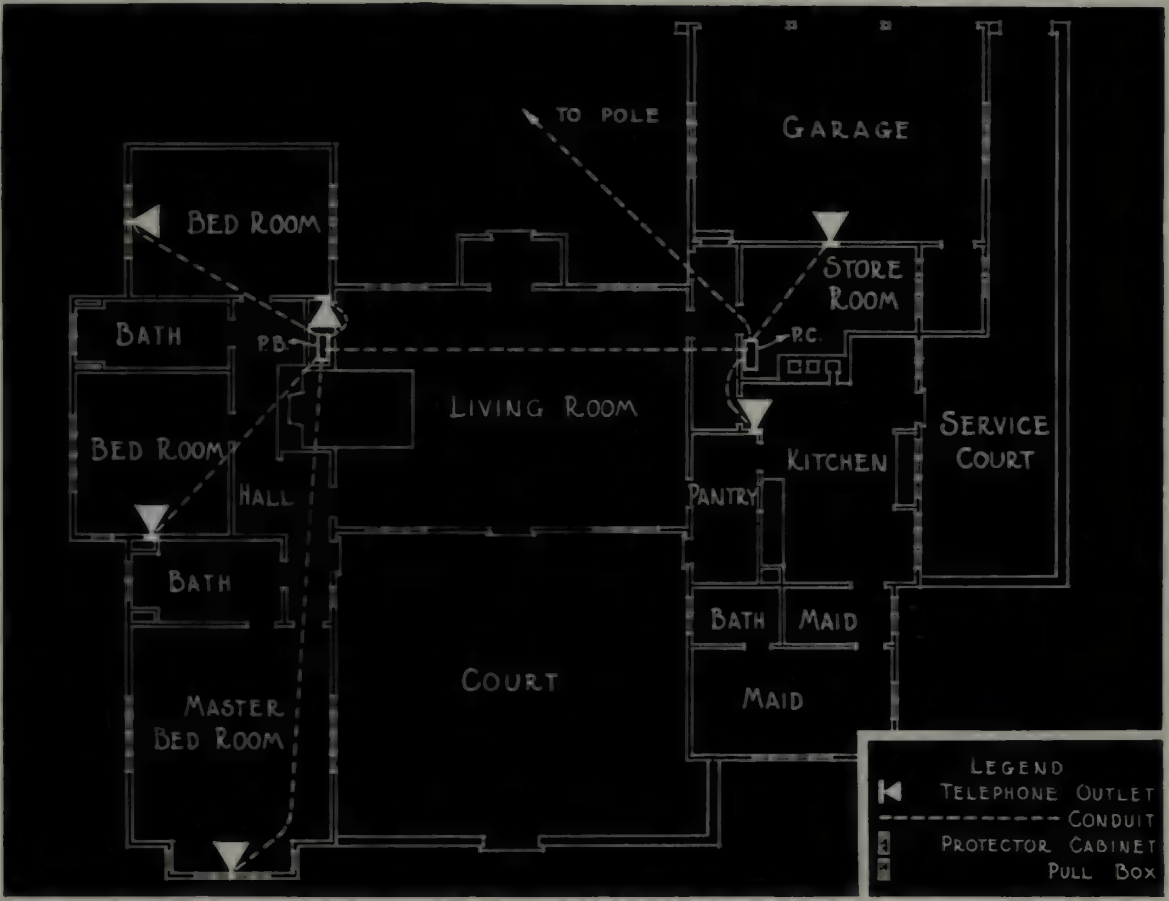
The modern Home provides for both Present and Future Telephone needs



Complete telephone convenience is provided in the residence of Dr. George W. Hawley, Bridgeport, Connecticut, by six telephone outlets, including one in the garage. The telephone wiring is carried in conduit hidden in the walls and floors. Fred C. Johnson, Architect, *Bridgeport.*

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  - Congoleum-Nairn, Inc.
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- **Garden Furniture and Ornaments**
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- **Gas Boilers**—American Gas Products Co.
  - American Radiator Co.
  - Dahlquist Mfg. Co.
- **Gas Ranges**—American Stove Company
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  - American Window Glass Co.
  - Pittsburgh Plate Glass Co.
- **Glass Wire**—See Wire Glass
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  - Fletcher, H. E. Co.
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- **Grilles**—General Bronze Corp.
  - Wickwire-Spencer Steel Co.
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- **Gypsum Slabs**
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BE SURE THE HEATING PLANT IS MODERN TOO

IDEAL GAS BOILERS

- Five years from now will your homes be as modern as they are today? Will the heating plants be the modern plants of that day?
- Ideal Gas Boilers are 100% automatic and will be as modern five years from today as they are now.
- Gas rates for house heating are being steadily reduced which is one of the reasons for the tremendous popularity and growth of automatic heating that is 100% automatic.
- That is why so many successful architects insist that the homes they plan be made really modern with Ideal Gas Boilers.

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The interest and harmony of this grouping has been accentuated by making Dubois part of the architectural scheme. Architects are now including Dubois in their specifications for its value in producing a pleasing ensemble.

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THE ORIGINAL *DUBOIS* REG. U. S. PAT. OFF.
Woven Wood Fence
Made in France

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Heggie-Simplex Boiler Co.
Johnson, S. T., Co.
Marsh, J. P. & Co.
Nash Engineering Company
Nelson, Herman, Corp.
Peerless Unit Ventilation Co., Inc.
Pierce, Butler & Pierce Mfg. Co.
Smith, H. B., Company
Sturtevant, B. F., Co.
Titusville Iron Works Co.
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National Electric Light Assoc.
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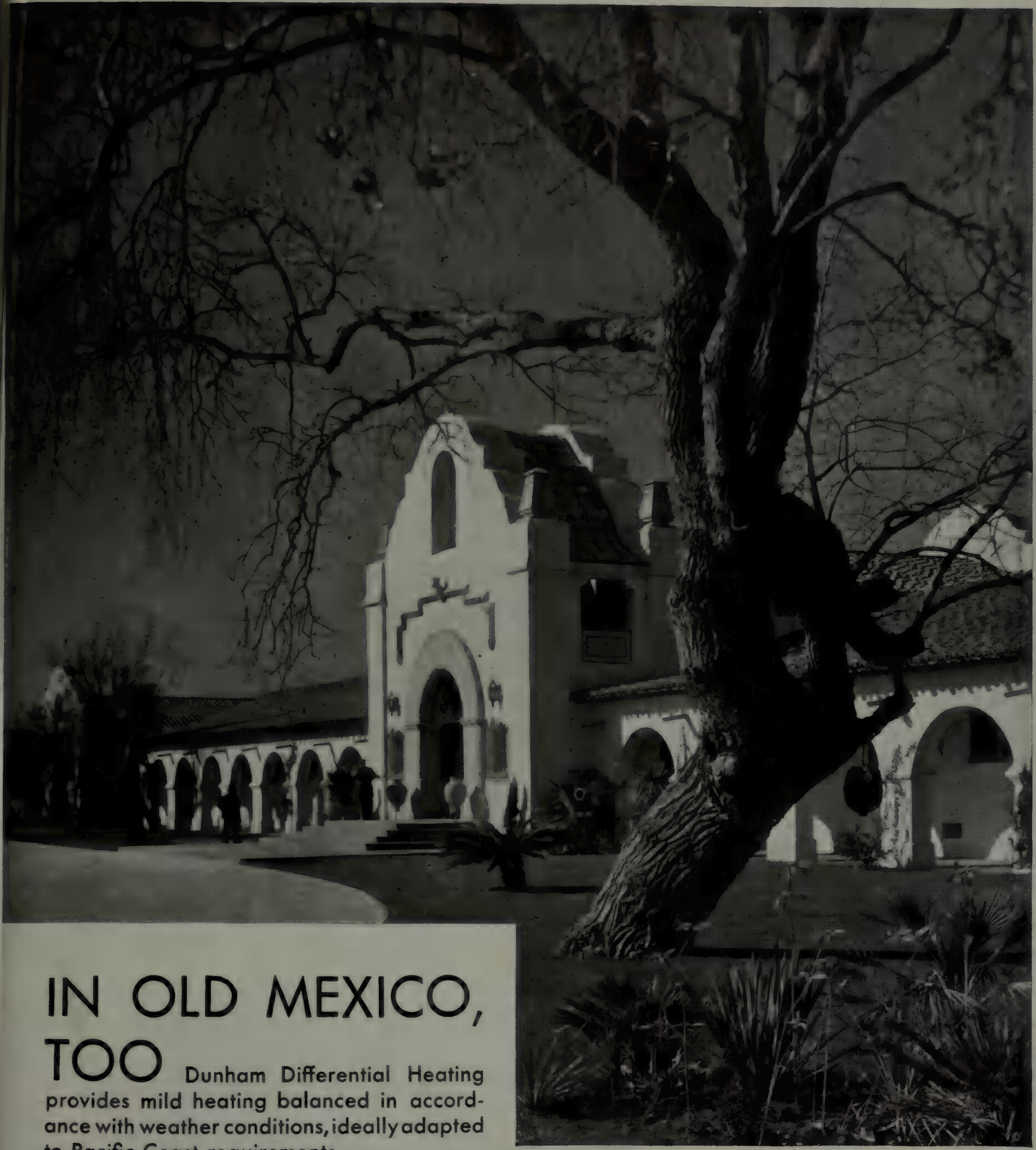

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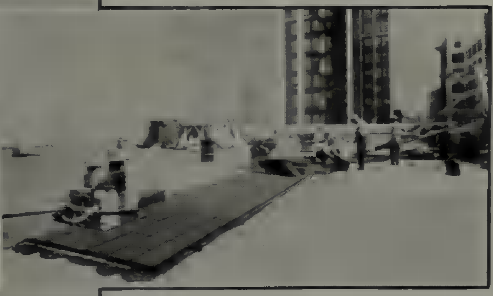
Left—The entire roof area of the Mountain States Tel. & Tel. Co. building, Denver, is insulated with Armstrong's Corkboard; top-floor offices are comfortable in any kind of weather. Architect—Wm. N. Bowman Co., Denver.

~ ~ ~

Below—On the roof of Mountain States Tel. & Tel. Co. building. Architect—Wm. N. Bowman Co., Denver; contractor—C. E. Walker Constr. Co., Denver; roofing contractor—Western Elaterite Roofing Co., Denver.

Below—Armstrong's Corkboard insulates the Southwestern Bell Telephone Co. roof, Kansas City, Mo. Architect—Hoit, Price & Barnes, Kansas City; associate architect —I. R. Timlin, St. Louis.

Below—2" Armstrong's Corkboard insulates the N. Y. Telephone Building, Buffalo. Architect—Vorhees, Genelin & Walker.



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So. Western Bell Telephone Bldg., St. Louis, Mo.
Indiana Bell Tel. Co., Marion, Ind.
Cumberland Tel. Co., Louisville, Ky.
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Bell Tel. Co., Montreal, Canada
Wisconsin Tel. Co., Kenosha, Wis.
Michigan Bell Telephone Co., Ann Arbor, Mich.
Southern Bell Tel. & Tel. Co., Chattanooga, Tenn.
Southern Bell Tel. & Tel. Co., Savannah, Ga.
So. Western Bell Tel. Co., Dallas, Texas
Bell Tel. Co., Philadelphia, Pa.—(3 *buildings*)
So. Western Bell Telephone Bldg., Oklahoma City, Okla.
Southern Bell Telephone Bldg., Greensboro, N. C.
Northwestern Bell Tel. Co., Minneapolis, Minn.
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  American Institute of Steel Const., Inc.
  Bethlehem Steel Co.
  Carnegie Steel Company

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  Rackle, George, & Sons Co., The

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Stone—Limestone
  Indiana Limestone Company
  Victor Oolitic Stone Co.

Stone—Marble
  Georgia Marble Co.
  Vermont Marble Co.

Stone Ware, Chemical
  Knight, Maurice A.

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  Michaels Art Bronze Co.
  Tyler Company
  Zouri Company, The

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  Jones & Laughlin Steel Corp.

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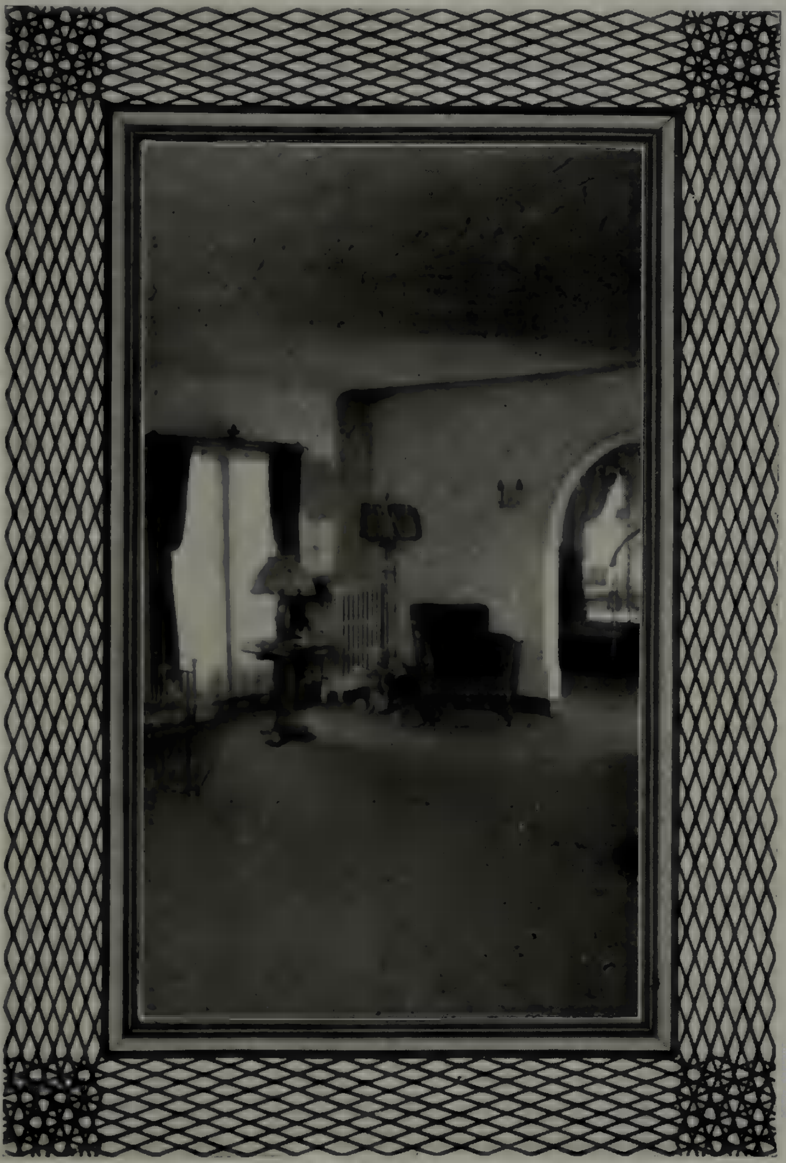

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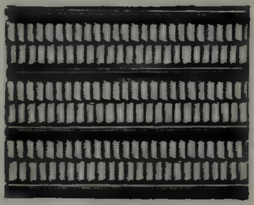

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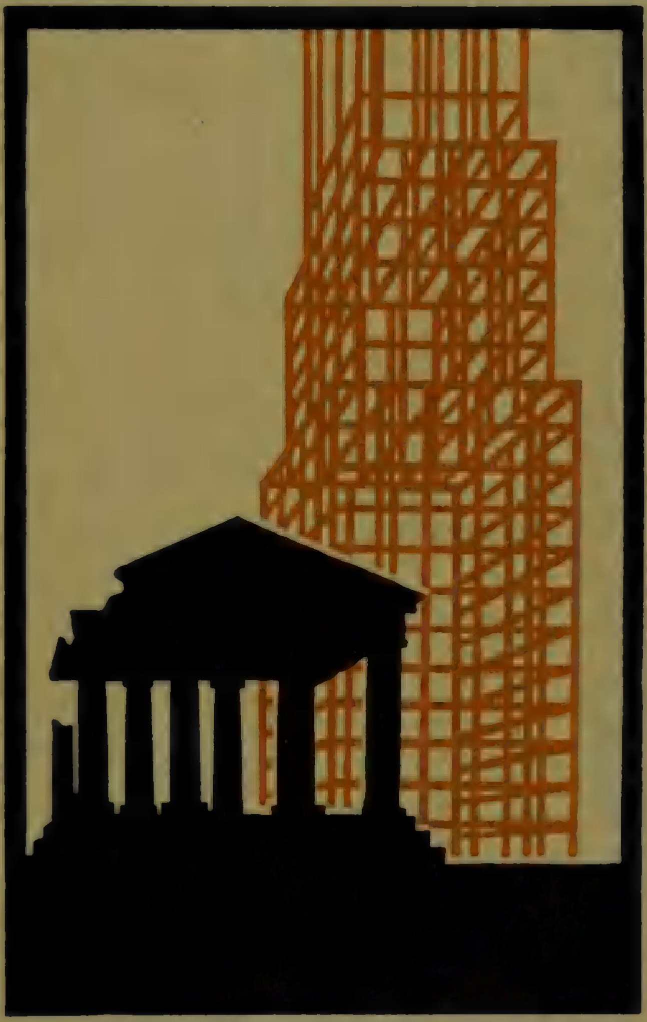

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Published Monthly by F. W. Dodge Corporation, 115–119 W. 40th St., New York
Truman S. Morgan, *President* Sanford D. Stockton, Jr., *Secretary* Howard J. Barringer, *Treasurer*

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Yearly Subscription: United States, Insular Possessions, Cuba, Canada, Central America, South America, and Spain, $5.00; Foreign, $6.50; Single Copy 75c.

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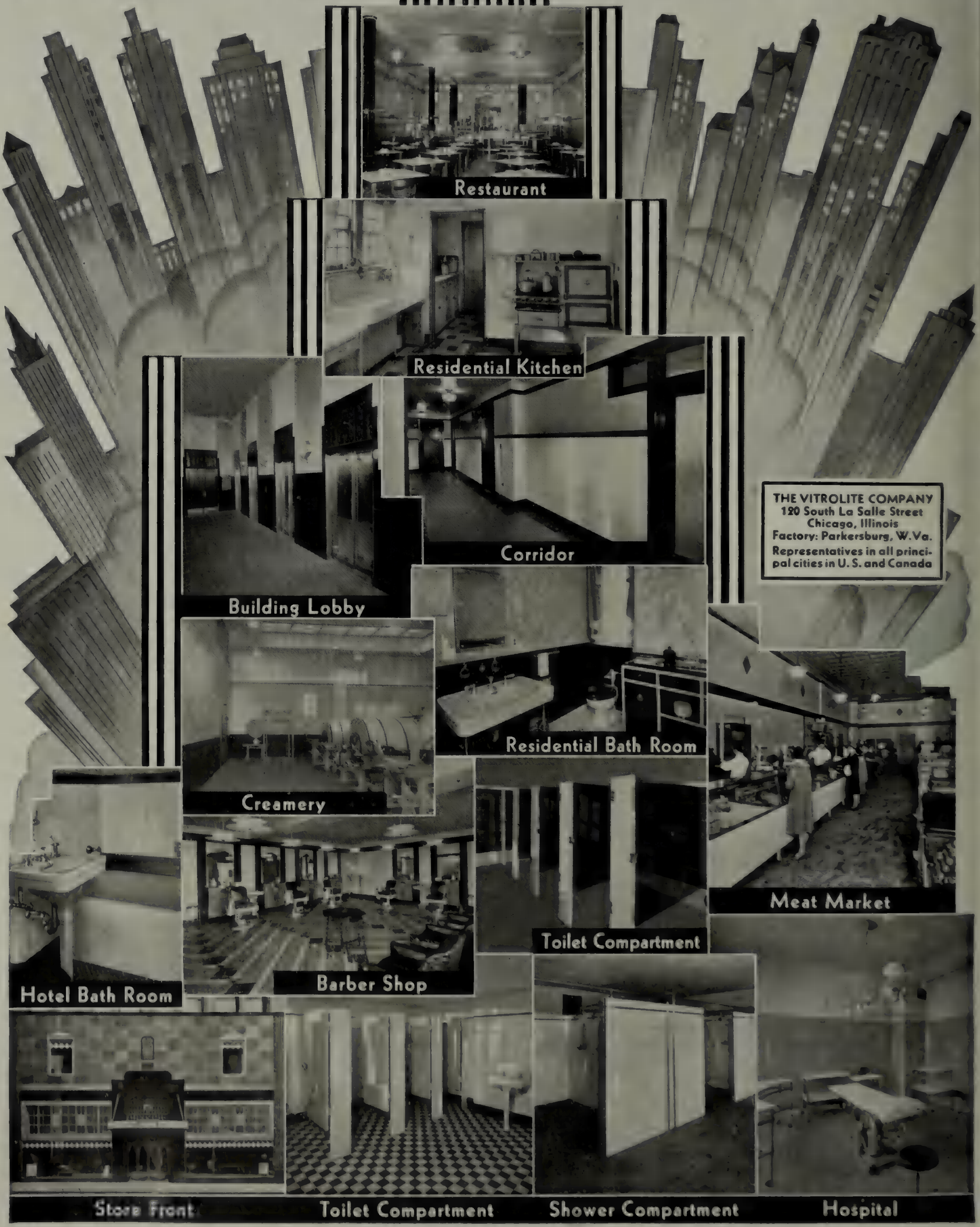

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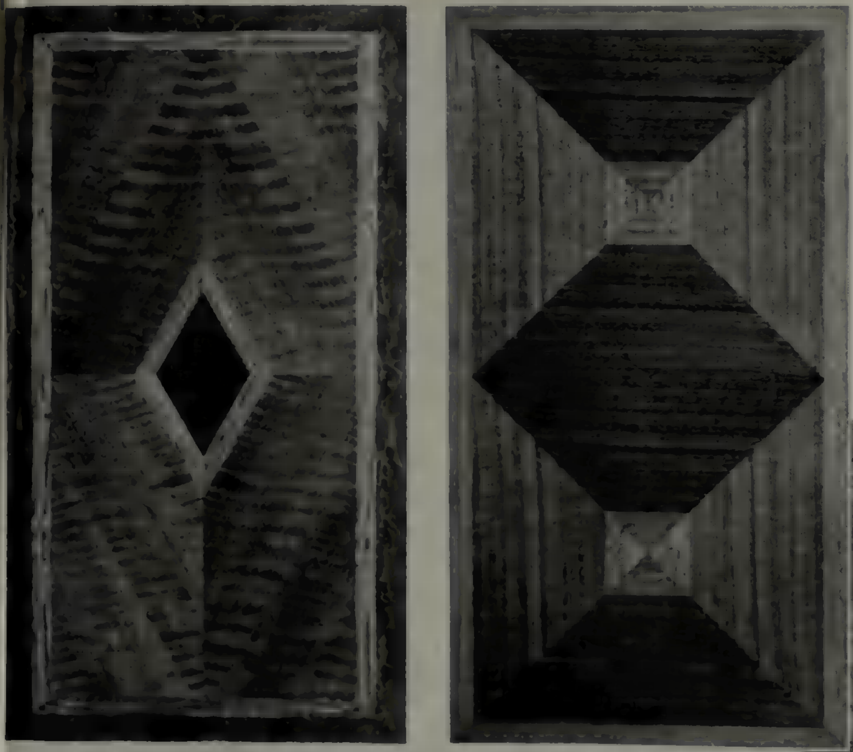
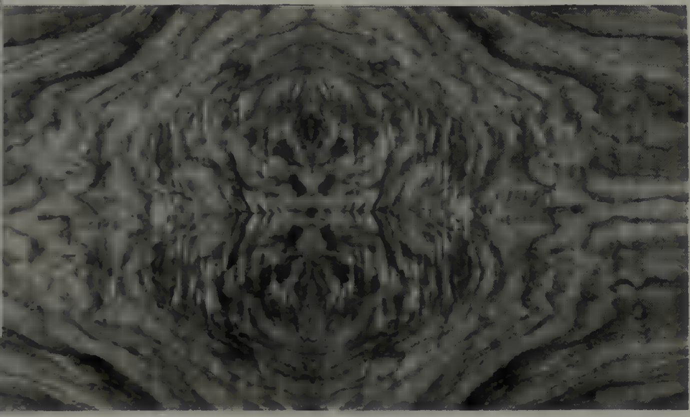


A few examples of the infinite possibilities of American Walnut Panels in various types of veneers and combined with other woods. Write for technical specifications for these and other panel designs.

so endlessly varying



● Quite inimitable, American Walnut's figure is so varied as to harmonize with any type of design. No other material permits such diverse treatment.

Straight lines, gently waving lines, whorls, or intricately conceived patterns are all possible. New methods of producing American Walnut for veneered panels and interior trim are being developed daily.

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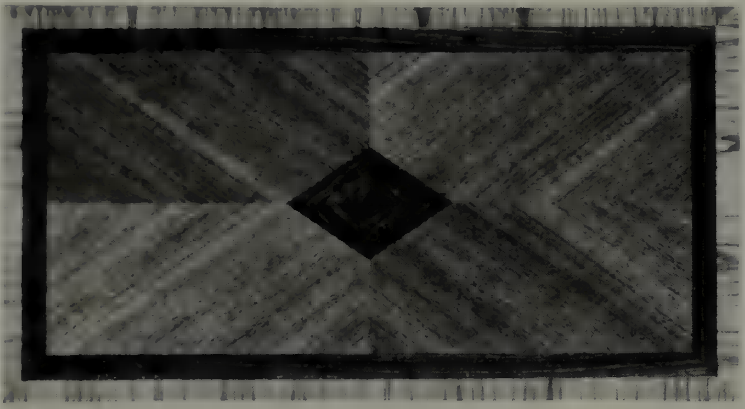

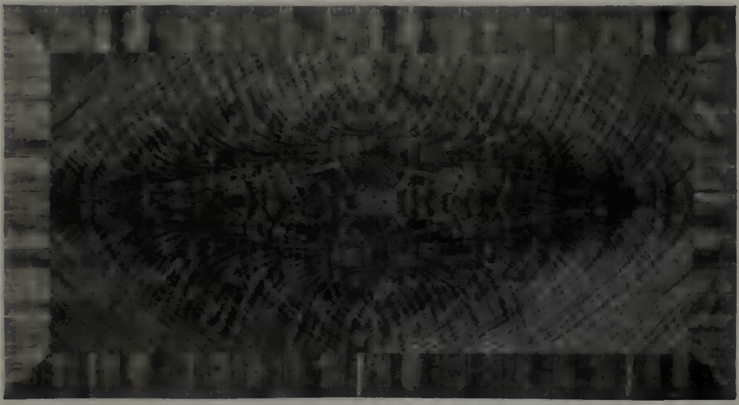

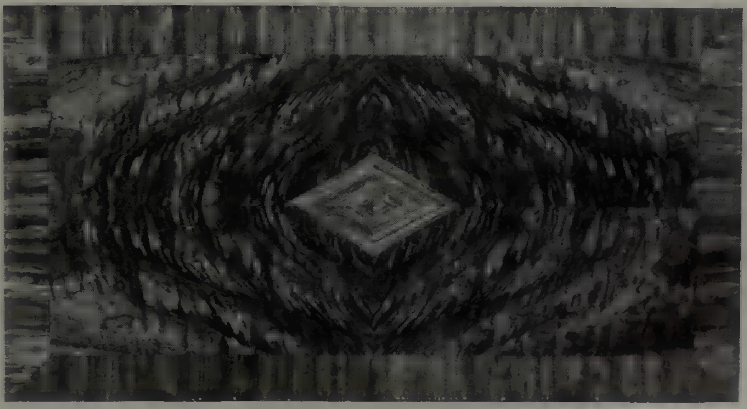

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millions of dollars will be saved in fuel, maintenance and lowered building costs

OUT of many years of study, research, and practical experience in the field of school ventilation a new science has evolved which is the basis of a new ventilation art.

This art in many ways is contrary to past practice.

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Most present and past practice has been based on the assumption that harmful and injurious effects resulted from the inhalation of respirated air. Therefore the object of most ventilation systems was to continuously flood the room with outdoor air in order to dissipate the so-called "crowd poison."

Scientists of today however, as a result of observation and practical experimentation, assert that the theory of outdoor air being the vital requirement of ventilation is unsound. They maintain that the indoor conditions essential to health, comfort and alertness are: 1. Atmospheric activity. 2. Relative humidity. 3. Control of room temperature.

The acceptance of these facts provides a basis for the new Herman Nelson System of Ventilation. This system provides to a nicety the requirements that science now prescribes. With this system instead of introducing a fixed amount of outdoor air into a room, out-of-door air is admitted only when required to control temperature and dissipate odors.

HUMIDITY

With the Herman Nelson System, proper indoor atmospheric conditions may be maintained automatically through proper air motion, humidity limitations, and temperature control. Such outdoor air as may be required for the removal of excess body heat and odors is tempered to

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System—ventilation practice!

just the right degree through inner-mixture with room air—but is not preheated.

It is estimated that the Herman Nelson System of Ventilation will save approximately half the fuel bill, for it is no longer necessary to heat the large volume of cold outside air, that in the past was admitted into the schoolroom during the winter months.

Further economies result in building construction through the use of smaller boilers, reduced pipe size, and through the elimination of vent flues.

The Her-Nel-Co Ventilator is the principal equipment used in the Herman Nelson System of Ventilation. This machine together with the required amount of direct radiation will amply serve the schoolroom.

The cabinet is finished in beautiful morocco enamel with bronzed fittings. The cabinet contains the Herman Nelson Wedge Core radiator for heating the room air which circulates through it—a fan motor for quietly forcing air circulation, a filter for cleansing air of dust and dirt, a steam jet humidifier and dampers either automatically or hand controlled for regulating the admission and intermixture of indoor and outdoor air.

While the Herman Nelson System of Ventilation is a new and radical departure from all previous schoolroom ventilation practices, it is based on fundamental scientific facts long recognized by leading hygienists and engineers. It is welcomed as the most practical solution of the school ventilating problem, for it is the most positive application of the laws which modern research has discovered.

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The Herman Nelson System of Ventilation is the logical development of the Univent System which has won universal recognition for its outstanding results. The Univent System meets in the simplest, most practical way, those conditions where a continuous supply of outdoor air is desired or specified by state code.

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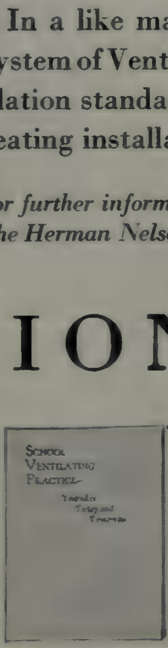

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An old-timer of the Old South. The Tidewater Red Cypress on this plantation dwelling in Southern Louisiana has served well over one hundred years. Photograph by Tebbs & Knell.

HUNDREDS of Early American houses, built of Tidewater Red Cypress (Coast Type) before the Revolution, are still in sound and serviceable condition.

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Architects have long favored the Wood Eternal, especially for exterior use—not only because of its lasting qualities, but also because of its easy workability, even surface, and tight coherence with paint.

The Tidewater Red Cypress on this charming residence in Montclair, N. J., should still be young and repair-free one hundred years from now. Arthur T. Remick of New York was the architect.

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Many prominent architects are using large quantities of Tidewater Red Cypress to achieve beautiful interior finishes, for its exquisite grain enhances the beauty of any room.

Illustrations of their work have been compiled in "A Book of Interiors" to show you the different ways the Wood Eternal can be used to attain delightful effects.

For your complimentary copy write to the Southern Cypress Manufacturers' Association, Jacksonville, Florida.

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(COAST TYPE)

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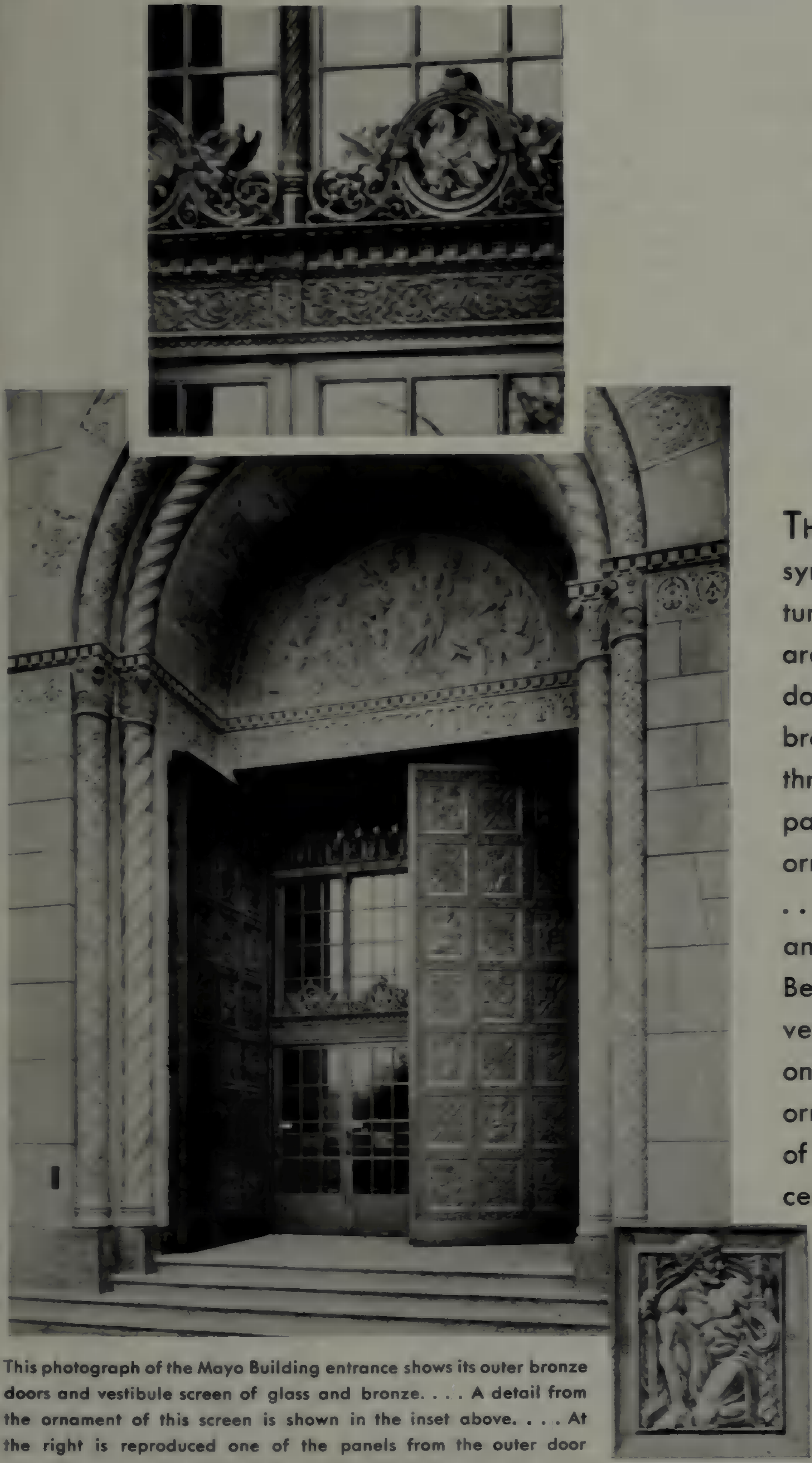

This photograph of the Mayo Building entrance shows its outer bronze doors and vestibule screen of glass and bronze. . . . A detail from the ornament of this screen is shown in the inset above. . . . At the right is reproduced one of the panels from the outer door

A Doorway of Remarkable Beauty

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●

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Symmetry of design is achieved by harmonious, flowing lines, expressive of the best thought in the architecture of modern office interiors. An important saving in floor space is accomplished by the use of more compact posts. By reason of a more rigid construction, longer sections are possible without lateral or ceiling braces. Complete interchangeability of all units—door or panel sections—is assured. Your wiring is run through the hollow sections and there is a removable batten on the chair rail for wiring changes. The new assembly results in far easier erection. And—a major improvement—you will find that movability is much increased by easy and faultless fitting and by absolute standardization of the units.

Your Sanymetal representative will gladly present visual evidence of these basic betterments in steel partition design.

Sanymetal steel office and factory partitions are made in four types for every purse and purpose. Sanymetal also builds steel toilet, shower and dressing compartments, and hospital cubicles. Communicate with Partition Headquarters:

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1704 URBANA ROAD CLEVELAND, OHIO
New York Office: 536 East 133rd Street

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The Sanymetal Symbol

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Steel Toilet & OFFICE PARTITIONS

Building paper FAULTS *are* concealed between WALLS!

Building Strains . . . Settling and Shrinkage

Three powerful forces that split and tear ordinary non-resilient building papers wide open, regardless of their strength.

This between-wall splitting, tearing and dragging from the nails naturally leaves many holes for the penetration of moisture, water, dirt, wind and vermin, and is proof positive that only a paper that can adapt itself to meet such strains is good enough to protect the well built house.

Brownskin is the exclusive product of the ANGIER CORPORATION, pioneers in the manufacture of resilient waterproof papers in this country, and is the only paper that embodies all the essential requirements of the perfect building paper in a single sheet.

BROWNSKIN IS RESILIENT—will stretch as much as 11% in all directions without breaking or dragging from the nails.

BROWNSKIN IS MOISTUREPROOF—Even its outer surfaces are impregnated to prevent moisture from penetrating the fibrous texture.

BROWNSKIN IS WATERPROOF—a thick layer of asphalt positively prevents water from passing through the sheet should the slightest moisture penetrate the surface.

BROWNSKIN IS STRONG—It may be handled and laid without scuffing or tearing.

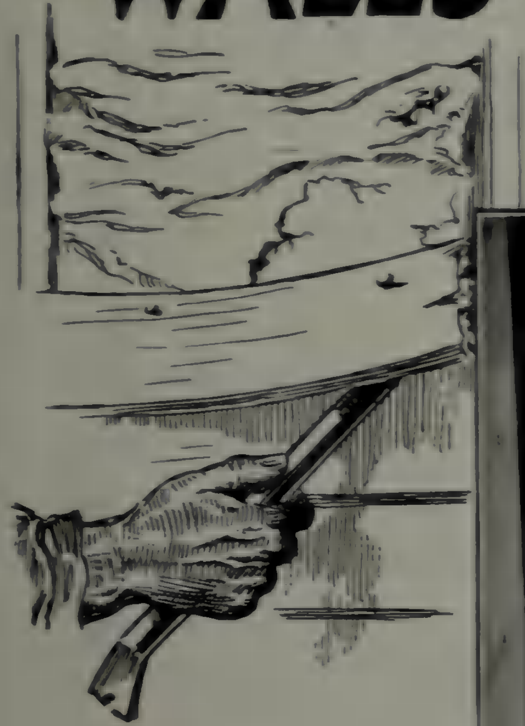
A typical example of what happens between walls to even the strongest non-stretchable building papers when subject to building strains—is illustrated below.

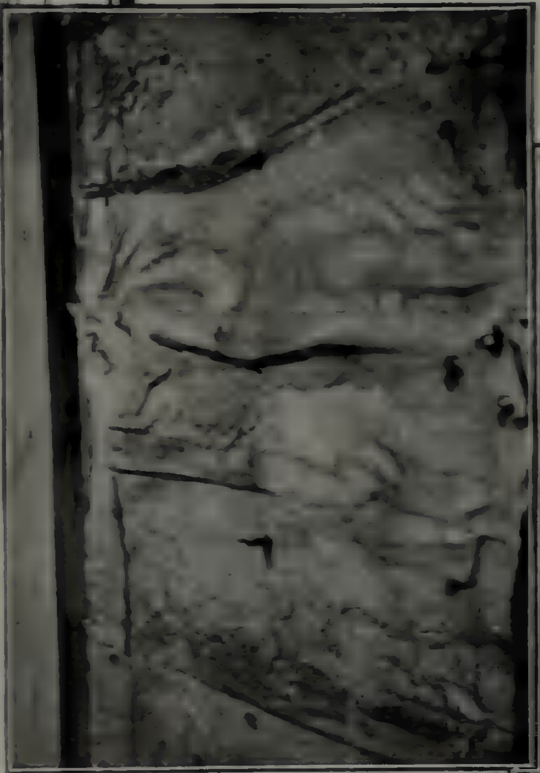
The foremost Architects, Engineers and Builders have learned that these building paper facts are true, and now specify Brownskin exclusively on all building projects.

BROWNSKIN is put up in rolls of 500 to 1,000 square feet in 36, 48, and 60 inch widths

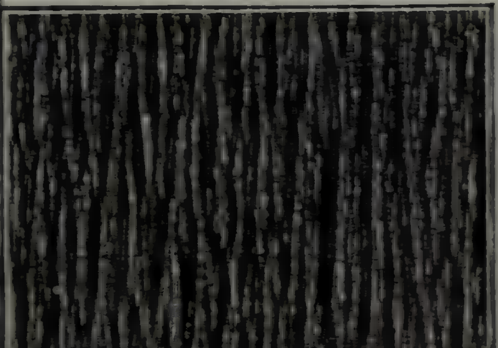
Your samples of BROWNSKIN and further information on this remarkable building paper are ready. Write for them NOW.

ANGIER CORPORATION
FRAMINGHAM, MASSACHUSETTS



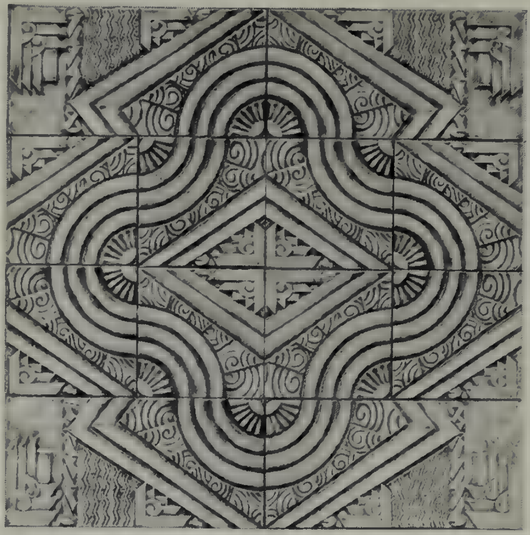


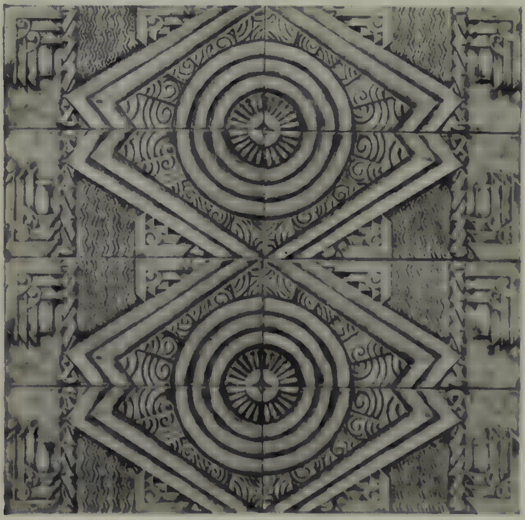
Proving that non-stretchable building papers scuff, tear, split and break at the nails under building strains, shrinkage and settling. The house being torn down was fairly modern.



Illustrating BROWNSKIN the Resilient, Stretchable Building Paper that conforms to all building strains and distortions without breaking.

Angier BROWNSKIN Resilient Building Paper





EVEN as nature etches upon the walls of cliff and canyon, patterns of beauty men can't forget, so the architect may embellish with fine designs the work of his own creation. White as new-fallen snow or colorful as a mountain sunset, decorative motifs may harmonize perfectly with that simplicity of form which is the keynote of the architecture of today.

For the reproduction of those unique and lace-like forms, so characteristic of modern ornament—whether geometrical, or otherwise—Northwestern Terra Cotta is the ideal medium.

The accompanying illustrations show a variety of designs all of which are constructed from one master mould of unusual form. Other designs of endless diversity may be invented or arranged. And each unit of terra cotta enrichment can faithfully be duplicated, as often as desired, from an original model, thus linking marked economy with lasting beauty.

THE NORTHWESTERN
TERRA COTTA COMPANY
DENVER · CHICAGO · ST. LOUIS

STANLEY
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PERMANENCY

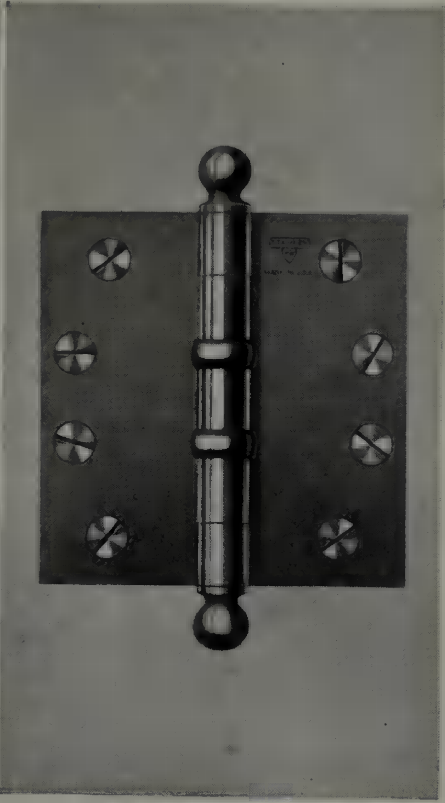
Stanley Ball Bearing Hinges swing the doors of the Baltimore Trust Building.

Symbolic of the institution that it houses, this outstanding bank building is built for permanency. The rigid requirements in materials demanded by Taylor & Fisher: Smith & May — Associated Architects, assures the occupants of every comfort and convenience.

In selecting Stanley Ball Bearing Hinges the architects have guaranteed smooth, trouble-free operation of the doors for the life of the building.

You will find our "Architects Manual of Stanley Hardware" particularly useful in making up hardware specifications. We shall be glad to send you a copy.

THE STANLEY WORKS
New Britain, Conn.



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BALL BEARING
HINGES**

for Permanence - Utility - Economy
Specify **WEISTEEL** *Compartments*

THE basic features of WeiSteel construction mean permanence in meeting the most rigid requirements. Consider the facts that partition panels are interlocked with, and welded to, the front posts; this interlocked and welded construction has been used by Weis for more than a decade and has demonstrated its utility in thousands of installations. Consider, too, the strength and sanitary advantage of the WeiSteel V-rail, which is formed at the top and bottom of each panel as a part of the panel sheet itself. There are no crevices or joints where the dirt can lodge.

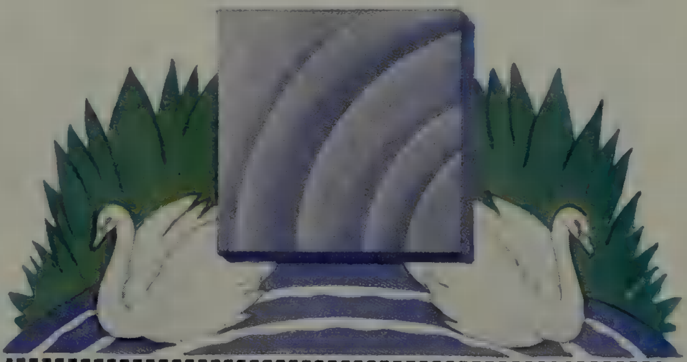
Space does not here permit details of WeiSteel design and construction. They are fully explained in Sweet's 1930 edition, following page B-2388. Should there be any special point not covered in our complete catalog in Sweet's, we shall be glad to work with you on it, without obligation of course.

HENRY WEIS MFG. CO., INC.,
ELKHART, INDIANA

Toilet and Dressing Room Compartments . . . Hospital Cubicles

A lad feeding swans in a crystal lake . . . the ripples fanning outward became an idea, the idea became a design, and the design became "Pond Ripple," an exclusive Robertson Planatile, one of a series created by Leon V. Solon, distinguished ceramic designer.

FIXTURES of conventional white in a modern and colorful setting of Robertson Planatile. Observe the simplified arrangement, giving room and daylight to the built-in shower beside the tub. Notice the novel treatment of Robertson Chromatex in the floor . . . forming a two-rug design in tile. Exclusive incised designs, the lustrous satin-finish and the new shapes may be combined to achieve new effects for foyers, conservatories, recreation rooms and kitchens, as well as bathrooms. Our design department will cooperate with architects and tile contractors in developing new and unusual effects.



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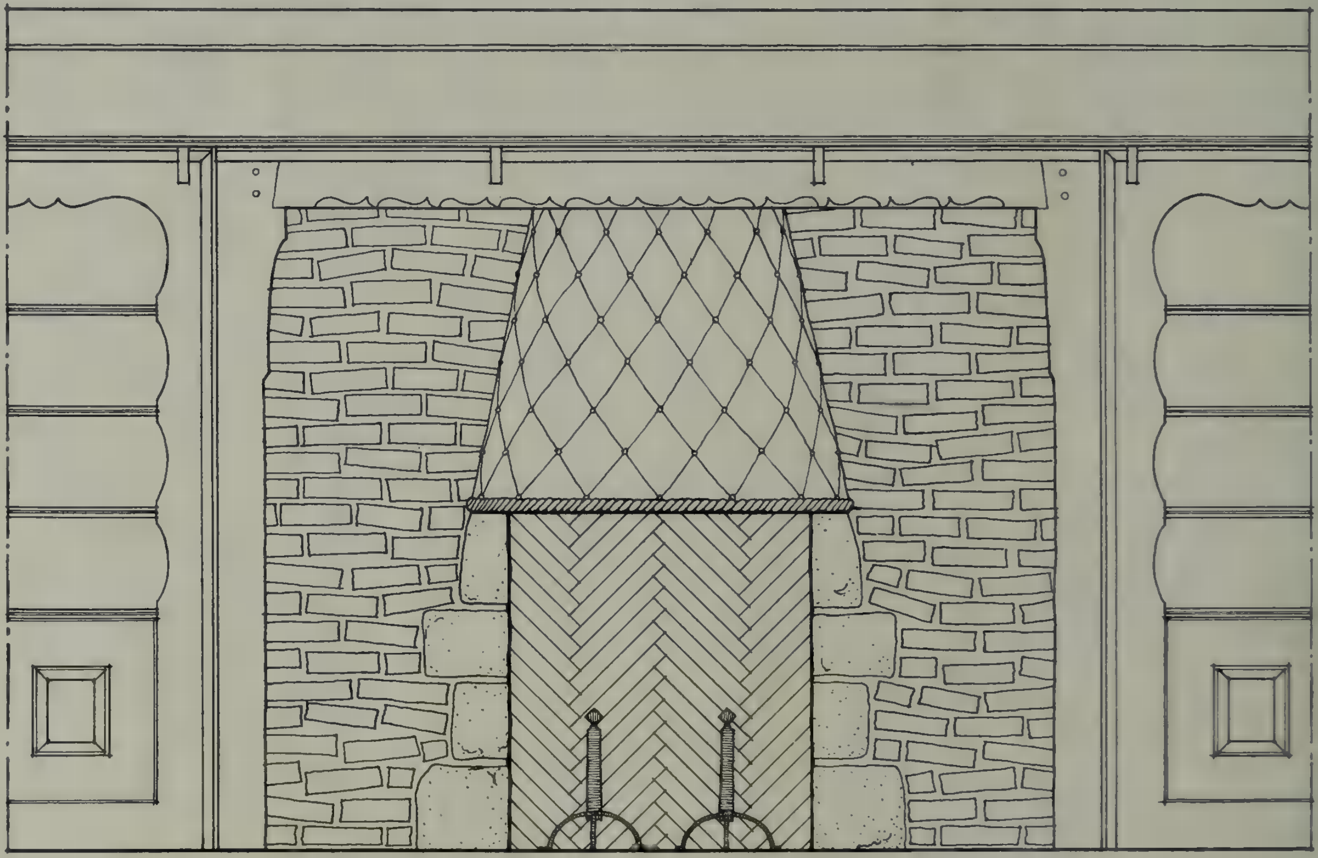
Planatile

THE NEWEST IDEA IN GENUINE TILE

COVERT

Fireplace Construction



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RESIDENCE OF A. M. SWANK, ESQ.
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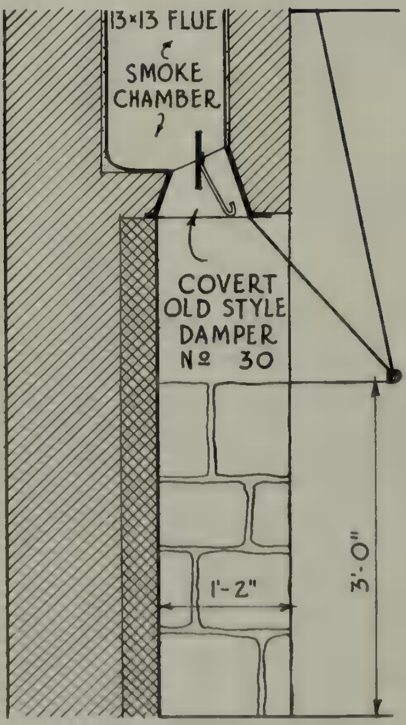

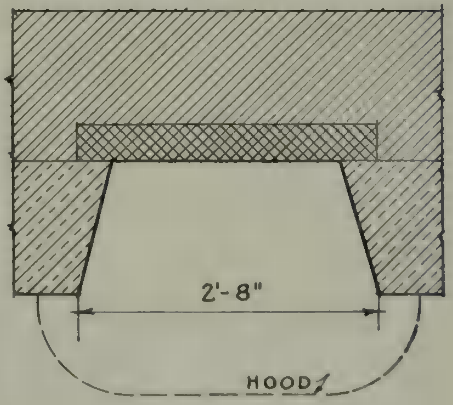

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SCALE IN FEET
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THIS IS THE FIFTH OF A SERIES ON "SUCCESSFUL FIREPLACES"
IF YOU WILL SEND US YOUR ADDRESS WE SHALL GLADLY FORWARD YOU A COMPLETE SET OF THE SERIES

THE H. W. COVERT COMPANY, 229 East 37th Street, New York

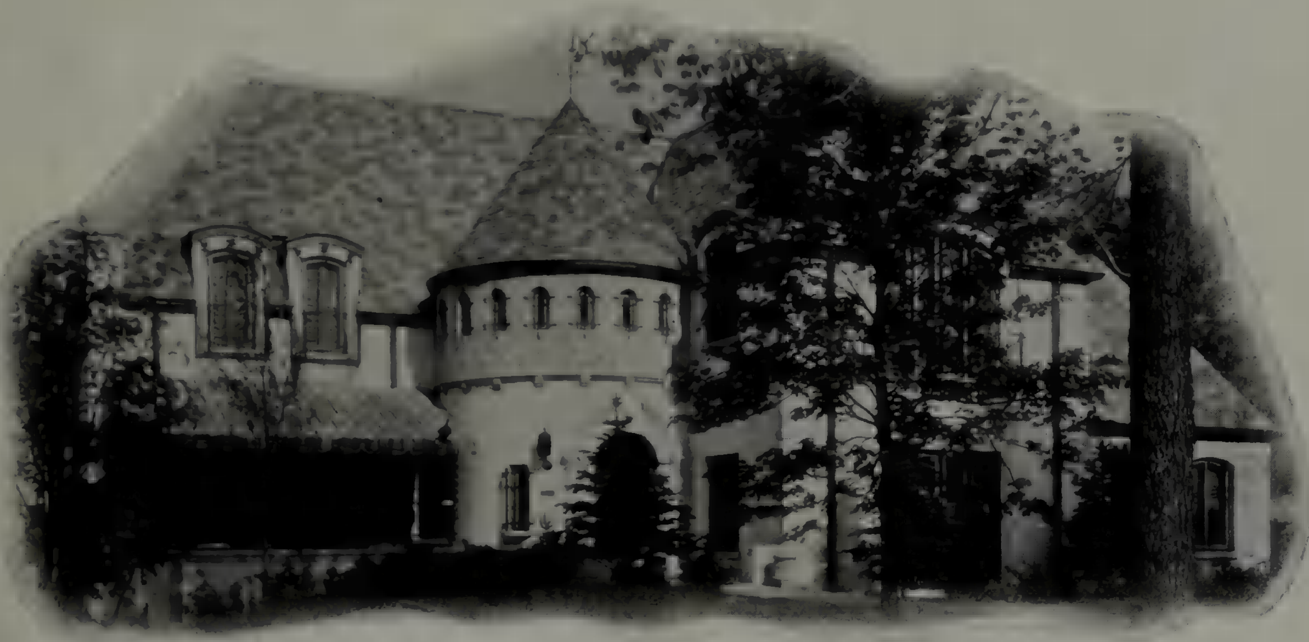
This Sheldon Slate Roof Suffers

from the inadequacy of photography of colors in just black and white

But even if it were as this photograph shows, we should still present it, as illustrating one of the advantages of Sheldon's Slates:

The advantage which enables you to secure any of a complete range of effects, be it a soft, even tone in plain pattern and texture, a roof variegated in gentle gradations, or a quite contrasty roof, as below.

And yet never harsh, strained, or artificial in appearance; but always possessing the deep beauty essential to the class of buildings for which Sheldon's Slates are just naturally specified.



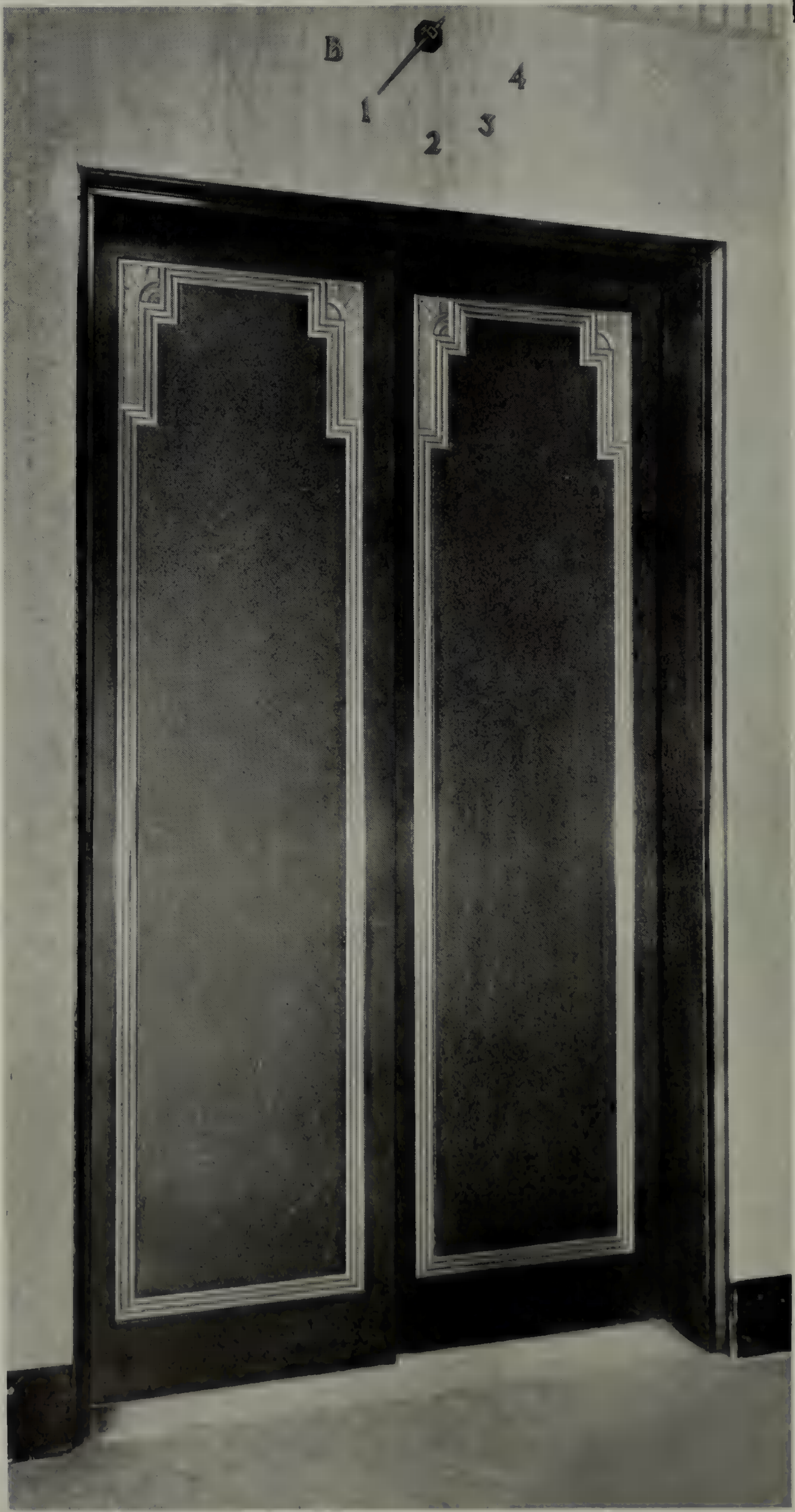
The Royer residence, River Forest, Illinois. Buurma Brothers, Architects

But the unlimited variety of effects obtainable by means of Sheldon's Slates need never cause confusion or make selection difficult; for the service we render you leads, without difficulty, to a roof that eternally has all the beauty of appropriateness. (See also Sweet's, for technical data and illustrations of Sheldon Roofs in colors.)

F.C. SHELDON SLATE CO.
GENERAL OFFICES · GRANVILLE · N·Y·
· BRANCHES IN PRINCIPAL CITIES ·

Elevator enclosures, Film Exchange Building, Minneapolis. Design by Larson and McLaren, architects.

Specify THORP DOORS



SIMPLE in line, modern in effect, rich in character, these Thorp Elevator Enclosures add a striking note of beauty to the lobby of the new Film Exchange Building, Minneapolis, Minnesota. The doors are of Thorp tubular construction with cast ornamental mouldings. Noiseless continuous guides kill light strikes at the bottom. Hollow metal frames and trim were used. The finish is stippled bronze.

Thorp craftsmanship, here as always, combines beauty with mechanical efficiency.

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THORP FIREPROOF DOOR CO. ***Minneapolis, Minnesota***

Featherweight Concrete
INSULATING ROOF SLABS

SLABS WEIGH AS LOW AS

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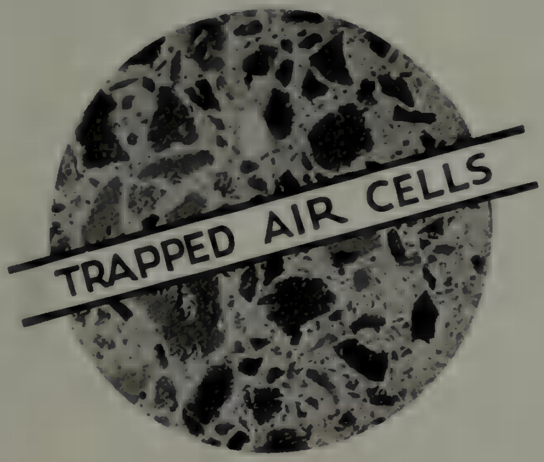
LBS. PER SQ. FT.

....Go on the SAME LIGHT STEEL FRAME that carries other roofs

Concrete has always provided the highest type of roof-deck available. In true permanence, fire-safety and freedom from maintenance, it has never been equaled.

Featherweight concrete goes a step further —it adds to these values a new *light weight* (as low as 10 lbs. per sq. ft.) and an *insulating* value, also new to concrete.

That the resulting economies are vital, is thoroughly proven by Featherweight's acceptance for the buildings of leading industrials, railroads and utilities, as well as for fine public buildings. Millions of square feet are in use. "Catalog and Roof Standards" on request.



Haydite aggregate with its millions of trapped air cells is used in place of sand, to make Featherweight Concrete. Haydite is burned shale — vitrified, impervious and strong.

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FEDERAL CEMENT TILE COMPANY

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FOR OVER A QUARTER CENTURY

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Harmonize with any Building Design

The architect's reputation for careful attention to detail is protected if he specifies Desco Store Fronts. For these handsome metal fronts not only set off display windows to best advantage, but are made in a sufficiently wide variety of metals (including solid copper, plain or embossed, solid bronze in all standard finishes and aluminum alloy) to conform with any building design. Then, too, they are sufficiently flexible to protect the glass against abnormal wind pressure. Specify Desco Store Fronts for your next building.

For full architectural details see Sweet's catalog. Write us for complete working data and price list. Remember, too, wherever you are there is a distributor near you. We also carry a complete line of "Desco" construction material in our New York City Warehouse.

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1670 West Fort Street Detroit, Michigan
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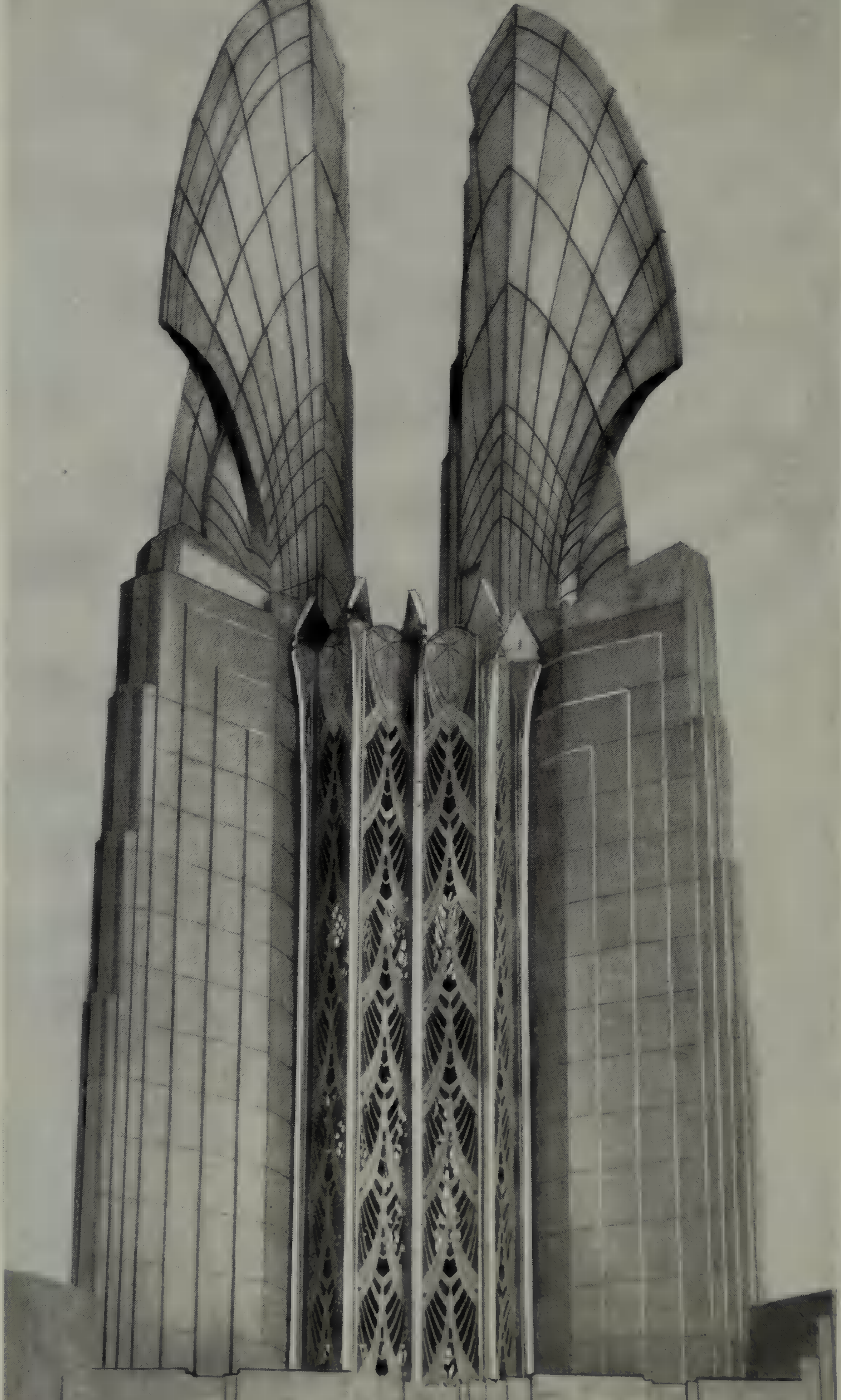
Pacific Coast Office—450 Skinner Bldg., Seattle, Wash.

Building—*Genesee Valley Trust Company Building, Rochester, N. Y. Architects: Voorhees, Gmelin and Walker, New York, N. Y. Associate Architect Carl C. Ade, Rochester, N. Y. General Contractor: A. Frederick and Sons Co., Rochester, N. Y. Ornamental Metal Contractor: Francis Metal Door and Window Corp., Rochester, N. Y.*

ALCOA

See how Alcoa Aluminum meets the Architects' desire for new structural and decorative effects



THE "Wings of Progress" and decorative grilles in the tower of the new Genesee Valley Trust Building emphasize the value of Alcoa Aluminum to the designer in search of a practical structural and decorative material in which to render his artistic visualizations.

The four wings extend from the top of the tower. 42 feet in height, they are cast of Alcoa No. 43 Aluminum Alloy. Their total weight is only 28,000 pounds. The seven grilles in the tower are also cast of Alcoa No. 43 Aluminum Alloy and weigh approximately 1120 pounds. Mullions and flood-light reflectors in the tower are made of Alcoa Aluminum sheet; 8000 pounds of sheet being used in their construction.

On the ground floor, the windows in the banking room are made of Alcoa Aluminum. Five of these windows having fixed sash, eight composed

ABOVE—The Tower, showing the Alcoa Aluminum grilles, mullions, and "Wings of Progress". Flood-lights of Alcoa Aluminum are placed behind the grilles so as to throw light on the wings.

AT RIGHT, NEXT PAGE—Banking room windows made of Alcoa Aluminum. Five having fixed sash are 12 ft. by 19 ft. 6 in. Eight composed of lower projecting window, 4 ft. 8 in. by 8 ft. 8 in., spandrel 4 ft. 8 in. by 6 ft., and upper projecting window, 4 ft. 8 in. x 6 ft. 6 in.

of lower projecting window, spandrels, and upper projecting window. The windows are made of extruded shapes of Alcoa Aluminum—the spandrels are cast of Alcoa No. 43 Aluminum Alloy left in the natural finish.

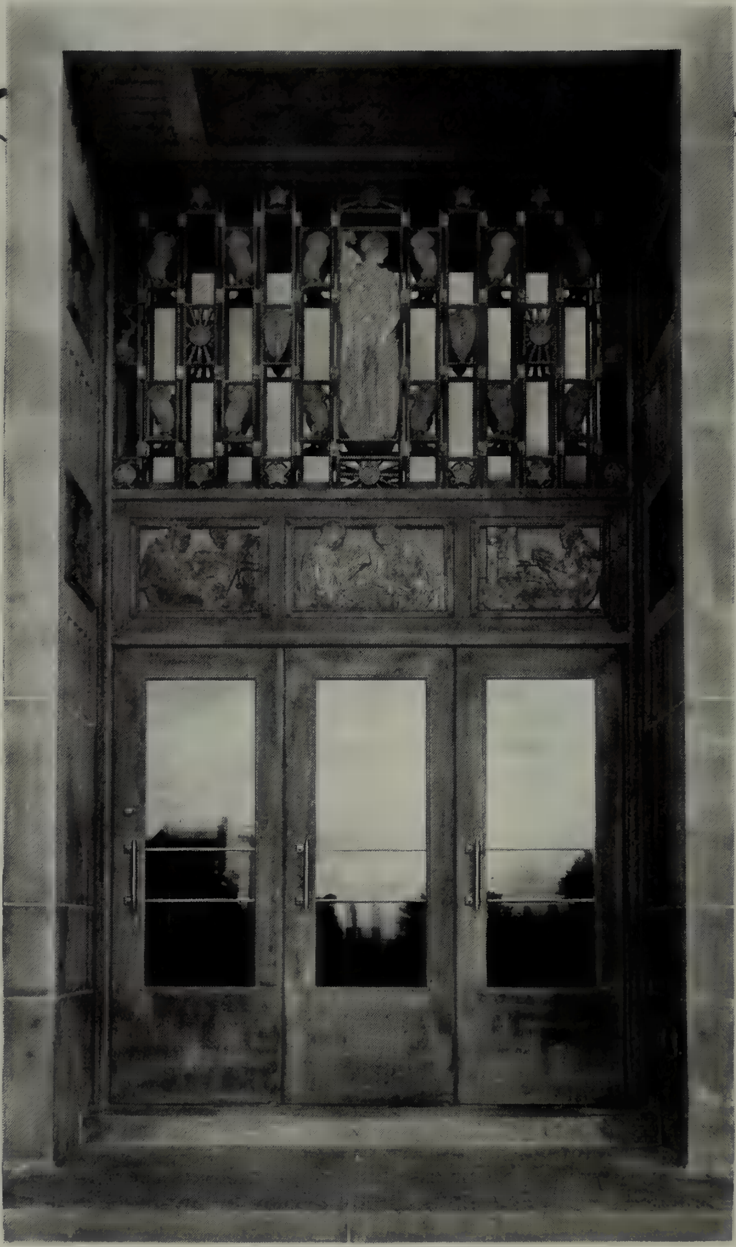
In this one structure, then, Alcoa Aluminum has been used in cast, extruded and sheet form. It can be forged, pressed, rolled, machined and welded. It may also be etched or finished in a number of different ways as required by the decorative scheme.

As Alcoa Aluminum weighs ⅓ as much as old-fashioned metals it is much easier to ship, truck and erect. It is tough and durable and, in addition, the weather will not make it streak onto adjoining surfaces. In addition to its many other advantages, the cost of Alcoa Aluminum is moderate.

Our nearest office will gladly send a representative to talk with you on this modern building material. Address ALUMINUM COMPANY of AMERICA; 2467 Oliver Building, PITTSBURGH, PENNSYLVANIA.

ALCOA ALUMINUM

ORNA-METAL WORK CRAFTED BY MICHAELS



University of Cincinnati, Library, welded doors, transom header and windows in antique verdi green finish. Designed by Architect Harry Hake. Crafted by Michaels.

The symbol of excellence for sixty years

For sixty years Michaels has translated into bronze, brass, aluminum and iron, not only the form of minutest perfection . . . but the living spirit of the architects' conceptions.

Orna-Metal work crafted by Michaels, faithfully reproduces the designs of the master builder with an understanding and technique that relieve him of much anxious responsibility.

Michaels welded doors, extruded window frames and store fronts are architectural and engineering achievements! To help you with these details we have prepared, ready for blue printing, complete sets of tracings. Your set in an indexed angular tab A.I.A. folder will be mailed you on request. Write today.

THE MICHAELS ART BRONZE CO.

Orna-metal Craftsmen Since 1870

251-257 Court Avenue Covington, Kentucky

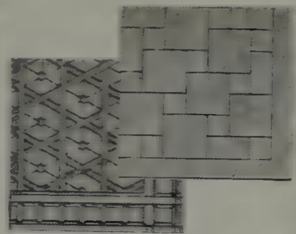
Church of the Holy Child, Philadelphia. George I. Lovatt, Architect.

Consult our experts on any problem in Architectural Acoustics

WITH the increasing desire to abate noise and provide better hearing conditions in all types of business, residential and public buildings, there has come a vital need for an organization which can render a complete service on all phases of architectural acoustics.

Through the creation of a variety of acoustical materials, and through the maintenance of a staff of experts, as well as competent installation crews, the United States Gypsum Company is in a position to prescribe impartially the materials best suited to the job, predict definite results and assume full responsibility for them.

Where a more comfortable noise level is desirable, Acoustone, the USG acoustical tile, is generally recommended. For creating proper hearing conditions in theatres, churches and auditoriums, and for abating noise in business offices, hospitals, restaurants, banks, schoolrooms, etc., Acoustone has been highly successful. It prevents noise disturbances by reducing the reverberation which is caused by the reflection of sound waves.



The many designs, patterns and color combinations which may be obtained with Acoustone make its use highly desirable in connection with any type of masonry, as well as other interiors.

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We invite you to call upon one of our experts who will gladly counsel with you on any problem in architectural acoustics. Samples and descriptive literature sent on request. Please address the United States Gypsum Company, Dept 43N, 300 W. Adams Street, Chicago, Illinois.

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WITH THE ENDORSEMENT OF
THE SOCIETY OF BEAUX-ARTS ARCHITECTS
THE NEW YORK BUILDING CONGRESS
APRIL 18 - APRIL 25, 1931
GRAND CENTRAL PALACE, NEW YORK

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This exposition will be a comprehensive presentation of Architecture, Sculpture, Arts and Crafts, Decorative Material, Building Materials, Utilities and Equipment and will command the attention of representative architects of America and the leading minds of the building world at a time given over to the study of what is progressive and worthy in modern building.

Your participation as an exhibitor is invited. If you will indicate your interest by letter or telephone, we will be pleased to forward our official prospectus and needed information.

Raymond M Hood
President,
The Architectural League of New York.

FIFTIETH ANNIVERSARY
1881 THE ARCHITECTURAL LEAGUE OF NEW YORK 1931
FIFTY YEARS OF SERVICE

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The metallurgist can see it. His microscope shows a complete and uniform austenitic* structure—absolutely non-magnetic.

The metal worker who has deep-drawn, welded, machined or bent Nirosta and other high alloy steels knows that production is less expensive and more satisfactory with Nirosta.

*AUSTENITIC, a term denoting a perfectly homogeneous metallurgical structure of alloying elements in solid solution. Chrome nickel steels, only when truly austenitic, are fully corrosion-resistant in either their unpolished or polished state and offer economical characteristics of ductility and workability.

The polisher can tell the difference in a minute. Nirosta takes a high polish easily because of the uniformity obtained by the exclusive heat treatment which distinguishes this aristocrat of alloys.

The user—be he engineer, oil refiner, architect or manufacturer of countless products — will tell you that Nirosta has no practical substitute for non-corrosive and architectural purposes.

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NIROSTA METAL PROVIDES MAXIMUM DUCTILITY AND RESISTANCE—ONLY OBTAINABLE WHEN PROCESSED UNDER KRUPP NIROSTA PATENTS BY THESE LICENSEES:

THE licensees—49 in number—representing the cream of the alloy experience and the bulk of the electric furnace ingot capacity in this country, offer ample proof of these facts. They will gladly direct you to their customers who have used Nirosta and other metals, that you may learn first-hand why Nirosta is different. Exhibit Room, Headquarters, Krupp Nirosta Co., Inc., 2638 New York Central Building, New York, N. Y.

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Roddis Flush Doors made today have twenty-five years of door making experience behind them. Roddis Flush Doors installed practically that long ago continue in service today. Thus Roddis manufacturing ability has a quarter century background as recommendation; and the product likewise has withstood the test of time and proved its merit. Roddis Flush Doors are universally preferred because of the known value secured: and agreed by architects as the most practical door for hotel and apartment buildings and residences particularly. Before you decide on doors write for and read the interesting new Roddis Catalog:

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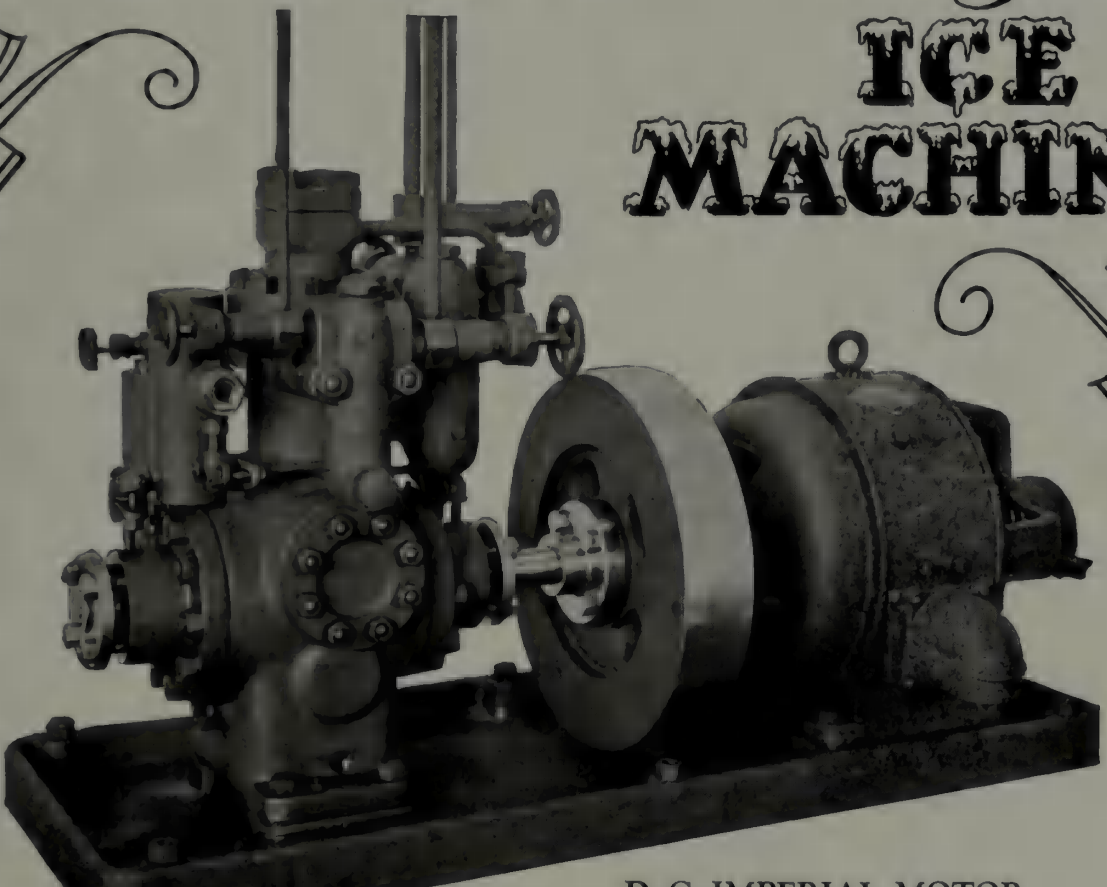
Many IMPERIAL MOTORS are used for ICE MACHINES



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OVER 40 years experience has resulted in motors that give many years of satisfactory service free from costly and annoying break downs. They are used by many where uninterrupted service is imperative such as in connection with Ventilating Systems, Pumps, Hoists, Elevators, Refrigerating Systems and Conveyors.

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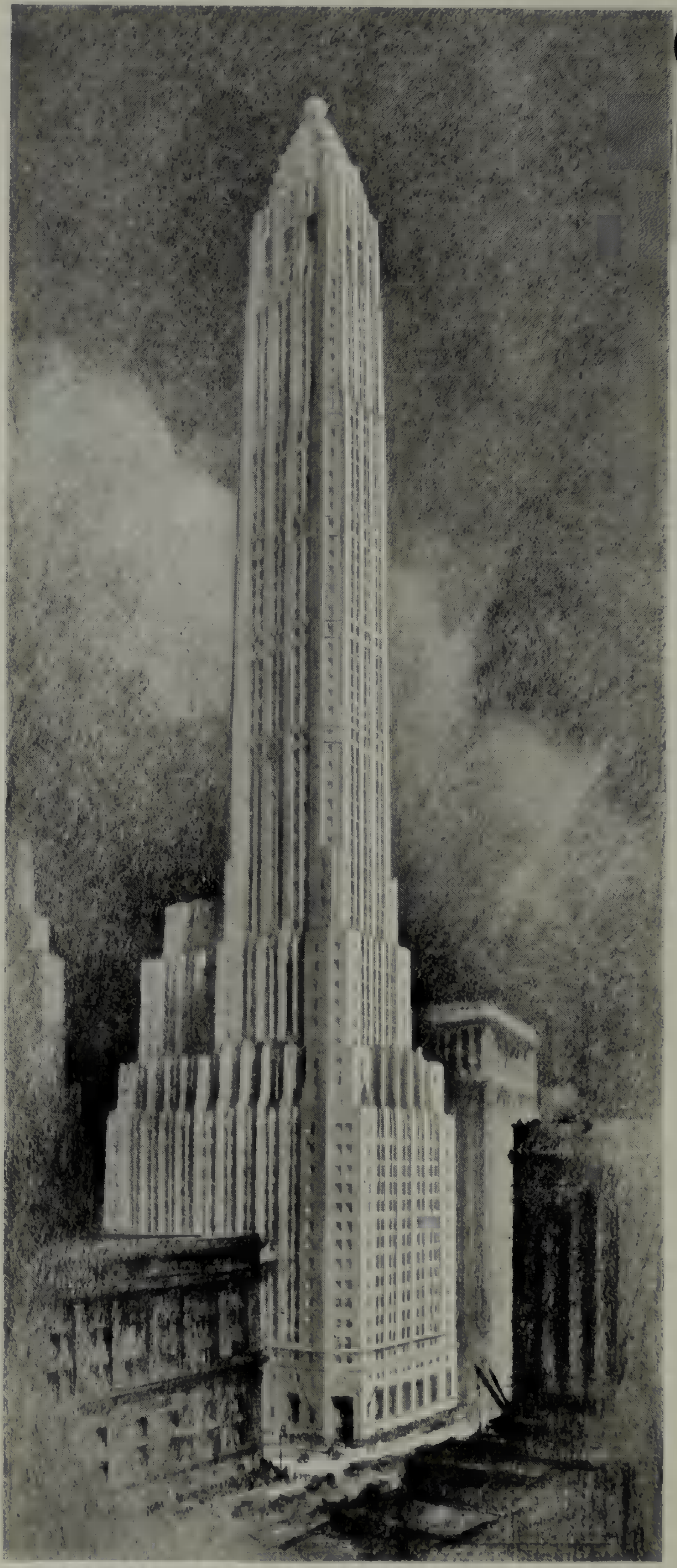

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NATIONAL CITY REALTY CORPORATION, *Owners*
Architects: CROSS & CROSS · *Builders:* GEORGE A. FULLER CO.

THE elevators in this sixty-story bank and office building are equipped to travel at the high speed of 1200 feet a minute. The Elevator Entrances, by Dahlstrom, all electrically operated, provide the precision required to harmonize with this high speed.

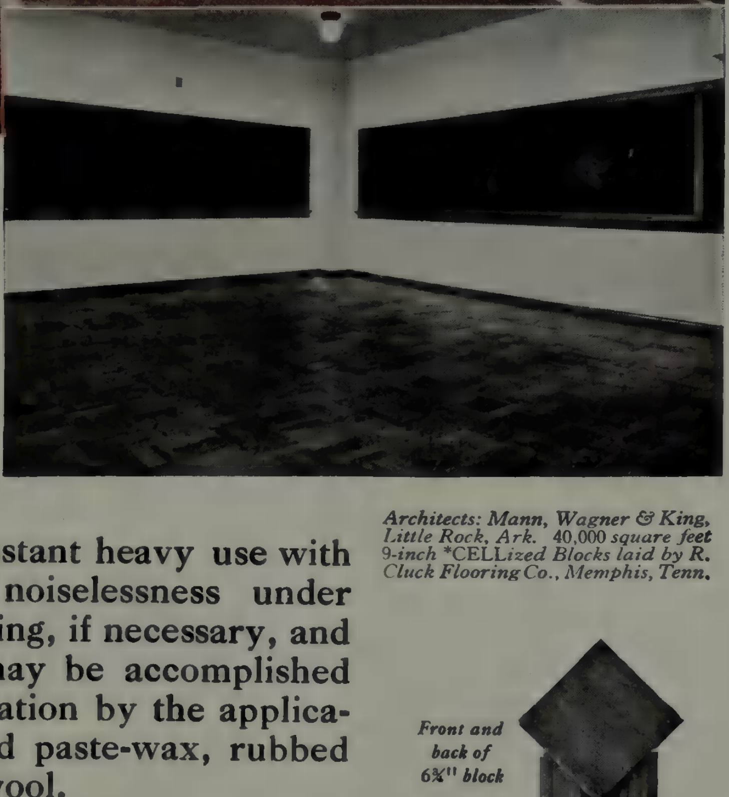
Elevator Entrances by

DAHLSTROM

THE DAHLSTROM METALLIC DOOR COMPANY, *(Established 1904)* JAMESTOWN, NEW YORK
WITH OFFICES AND REPRESENTATIVES IN PRINCIPAL CITIES

Each block is a complete square or rectangular unit of 3 or more flooring strips, in oak, walnut, maple, beech, light and dark Philippine mahogany, yellow pine—either beveled or square edge

6¾" to 13" squares, 13-16" thickness, all grades. Rectangle sizes; 6" x 12", 6¾ x 13½"; also in maple 6½" x 13".



Architects: *Mann, Wagner & King, Little Rock, Ark.* 40,000 *square feet* 9-*inch* *CELL*ized Blocks laid by R. Cluck Flooring Co., Memphis, Tenn.*

A very material saving in finishing cost

is effected by Maple and Beech blocks, factory-sanded, and then *CELL*ized*

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The unit block floor needs only to be laid in EVERBOND, a plastic cement, over concrete or any level sub-floor, before use. The appearance is highly pleasing, and the floor is durable, supporting constant heavy use with ease and noiselessness under foot. Cleaning, if necessary, and polishing may be accomplished in one operation by the application of hard paste-wax, rubbed with steel wool.

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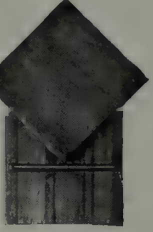
Laid directly over concrete in EVERBOND, *providing a sound-deadening resilient base.*



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*CELL*ized* wood floor blocks are guaranteed by *CELL*ized* Oak Flooring Inc. Laid only by Licensed Flooring Contractors. The names of those licensed to use this label in your locality will be supplied upon request.

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Vertically Drawn from the molten "Metal" to the finished state, Adamston Window Glass is perfectly flat and free from distortion—permitting a vision as clear as through the open window.

In addition to its clearness it has a beautiful lustre, either side may be glazed out, and it is of great tensile strength.

Adamston Window Glass is graded according to the highest standards, carefully inspected and packed to reach its destination with a minimum of breakage.

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OPEN WINDOW.

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Insulating homes against the dangerous drafts of winter with storm sash is an excellent investment, not only as a safe guard to the health of the family, but in the matter of fuel. Here again Adamston Window Glass may be specified with a feeling of security.

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On the south coast of England stands a curious little building called "Domesday Hut". As the name suggests, it was standing in 1086, and its original construction still remains—oak timbers thatched with *Zostera Marina;* the same tough, century-defying sea plant that is the insulating material in Cabot's Quilt. It is no wonder that our pioneer ancestors stuffed this plant into the walls of their houses; an example is the Pierce Homestead at Dorchester, Massachusetts, built in 1635. *Zostera Marina* is rot-proof, vermin-proof, and fire-resistant. It will never pack down, decay, or lose its insulating power. Therefore, you can use it to build a warm house in New Brunswick, a cool house in New Orleans, or a quiet house in New York. And if your client's needs are not so extreme as these, you can nevertheless use it to give him more comfort, health and peace of mind than he thought possible for so little money. The coupon below brings highly interesting information.

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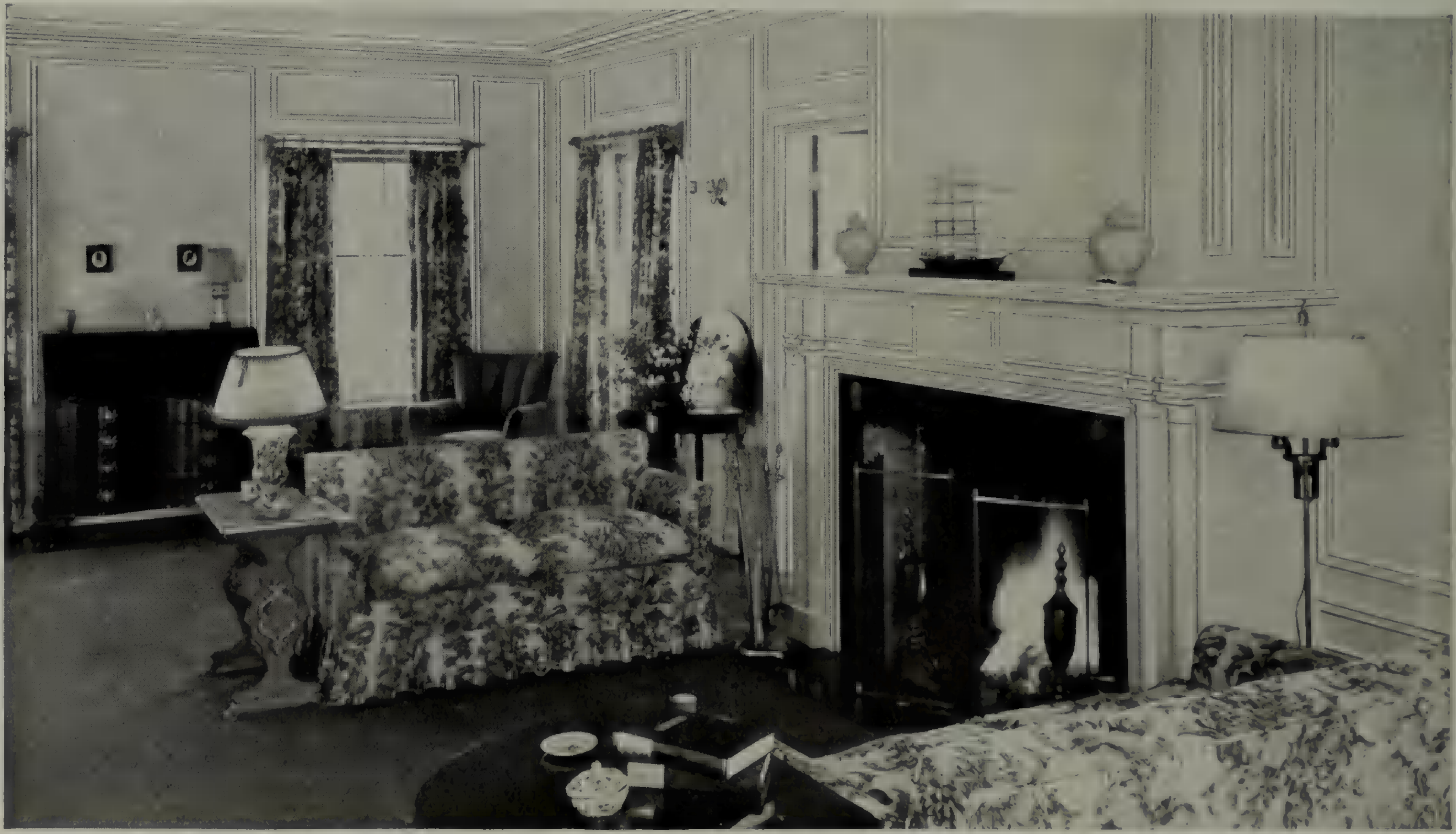
Minutely grained, Port Orford Cedar takes a lasting porcelain-like enamel finish. No grain shows through. Never crinkles or blisters. Requires no unusual priming coat.



A typical example of the sharp, precise detail of Port Orford Cedar woodworking—the living room of the H. W. Bunker residence, Hillsborough, California. Willis Polk & Co., Architects.

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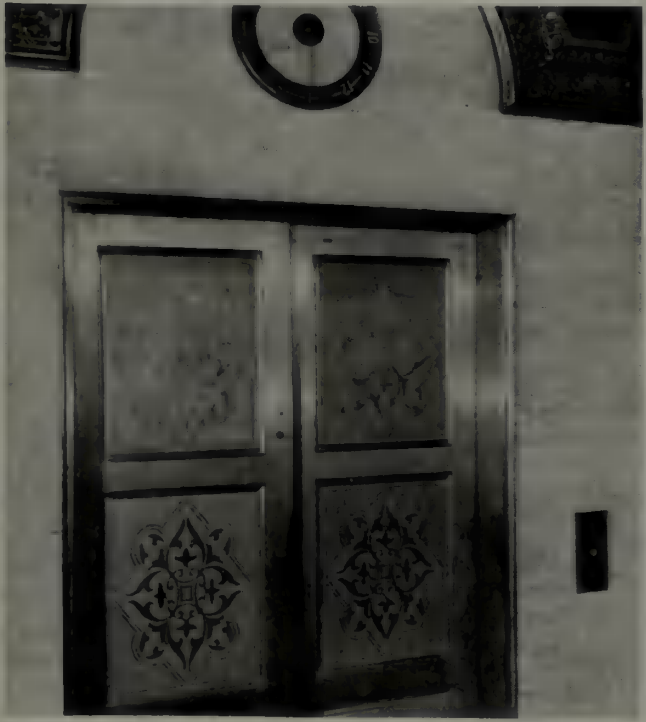
Three Examples of

BRONZE ELEVATOR DOORS Executed by ART METAL

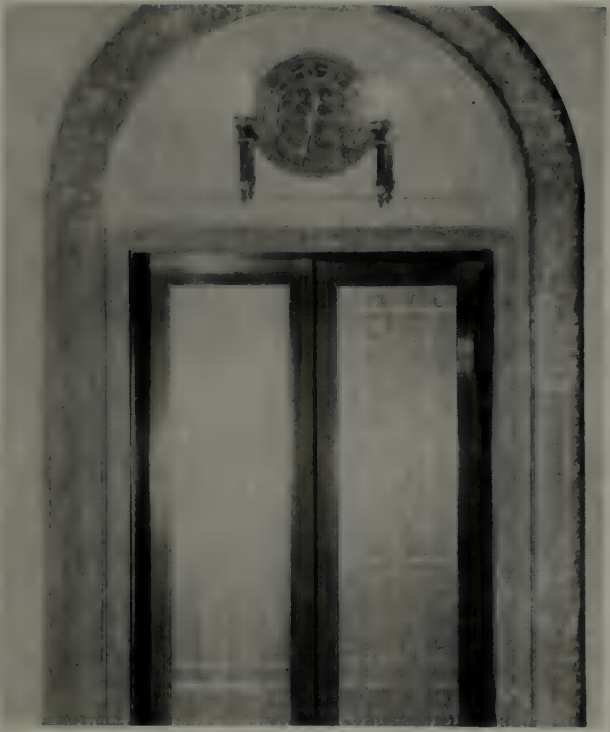


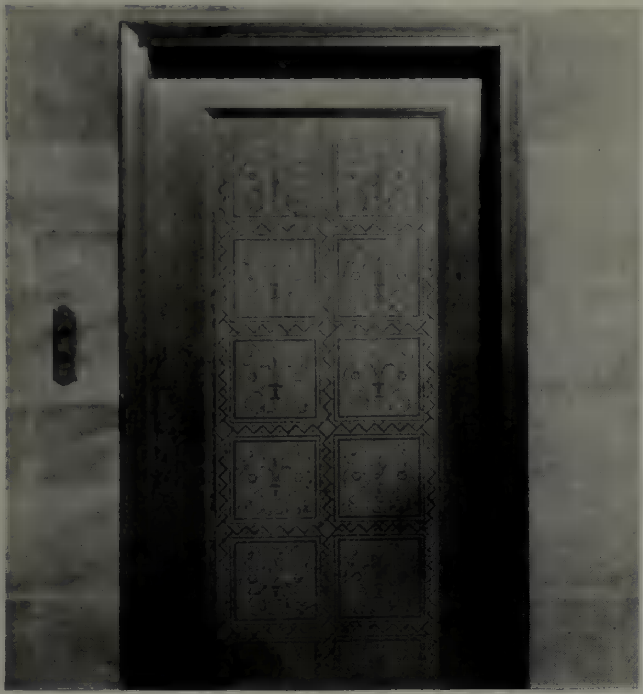
●

From the Imposing Spivey Building, East St. Louis. Center opening bronze doors add to the interest of every main floor elevator unit. Hollow metal doors were supplied for the other floors. Architect: A. B. Frankel.

●

From Baltimore's Largest Hotel . . . the new Lord Baltimore. Art Metal etched bronze doors add a final note of distinction to well designed elevator entrances. There are four panels on each door. Architect: W. D. Stoddart.





●

From Philadelphia's Smart New Chateau Crillon. Close-up view of the etched bronze elevator doors, each with six graceful panels, executed by Art Metal to the specifications of Horace Trumbauer, Architect.

THESE doors represent faithful renditions of the architect's designs. For forty years Art Metal craftsmen have been executing designs in bronze, steel, and, more recently, aluminum. We shall be glad to give you further examples of their work . . . or bring to any of your building conceptions our variety of experience and metal-working skill.

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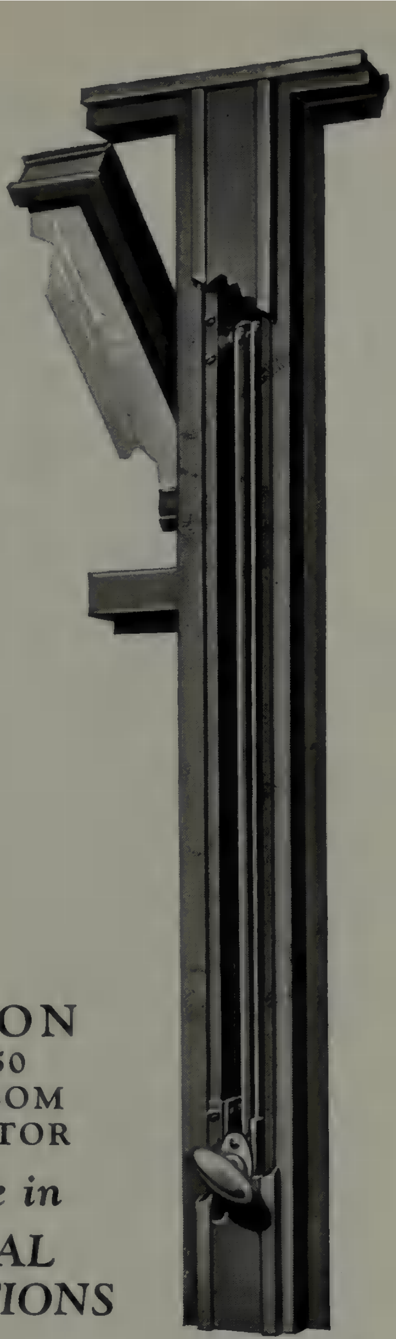
Tucked away

where there's scarcely room for a yardstick!



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for use in
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Only this handle remains in view. Power is such that 2½ turns open or close the transom to a maximum of 60°. Brass or bronze knob handle standard.

THE narrow and shallow space, in which this Rixson Concealed Transom Operator can be installed, makes it well suited for transoms in metal partitions. Concealed mechanisms have always been desirable in the better class of buildings. The "Rixson 50" now makes them practical. You can specify this device with the full confidence you have felt in other Rixson specialties.

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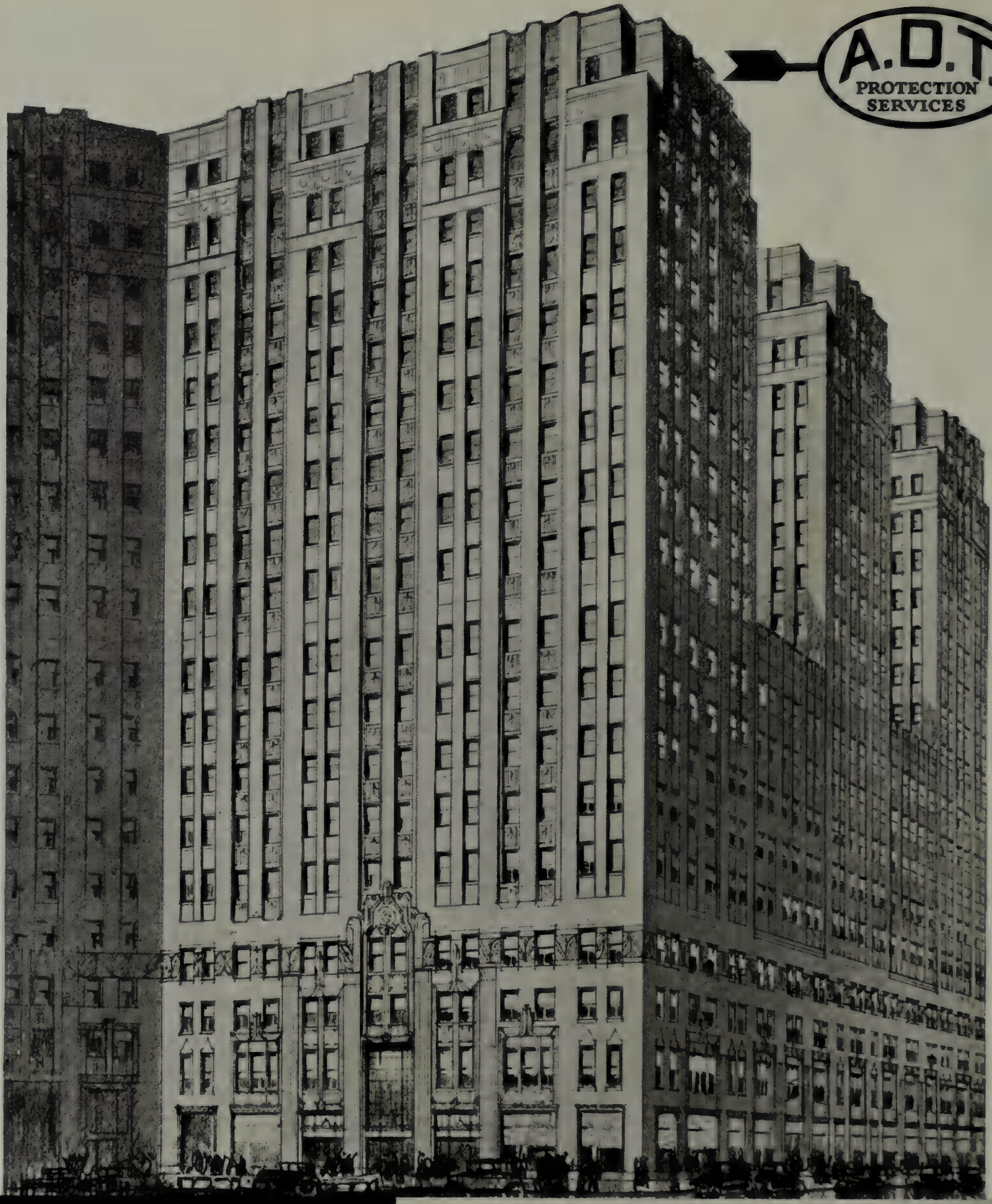

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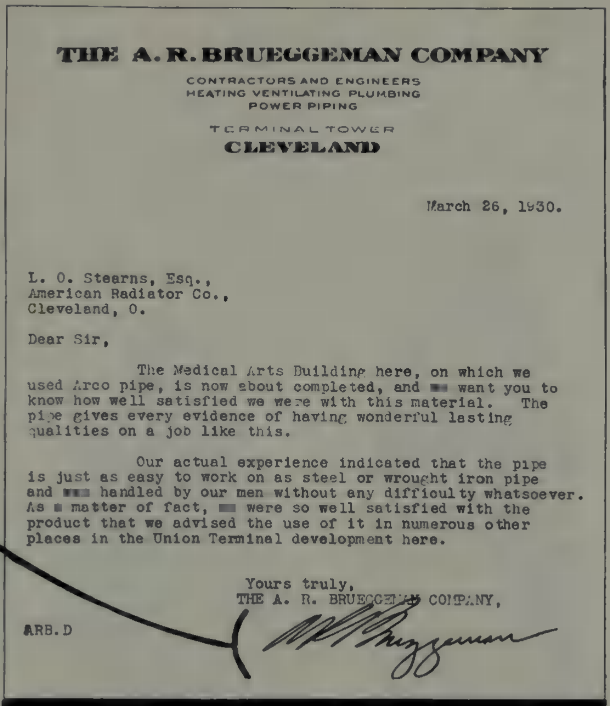

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March 26, 1930.

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Our actual experience indicated that the pipe is just as easy to work on as steel or wrought iron pipe and [illegible] handled by our men without any difficulty whatsoever. As [illegible] matter of fact, [illegible] were so well satisfied with the product that we advised the use of it in numerous other places in the Union Terminal development here.

Yours truly,
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VERTICALLY CAST SEAMLESS
REGULARLY FURNISHED IN 12′ LENGTHS

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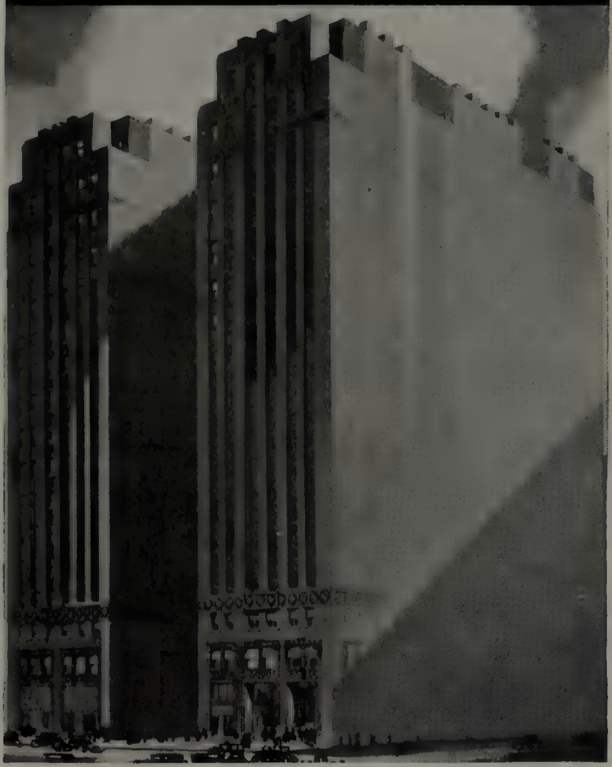

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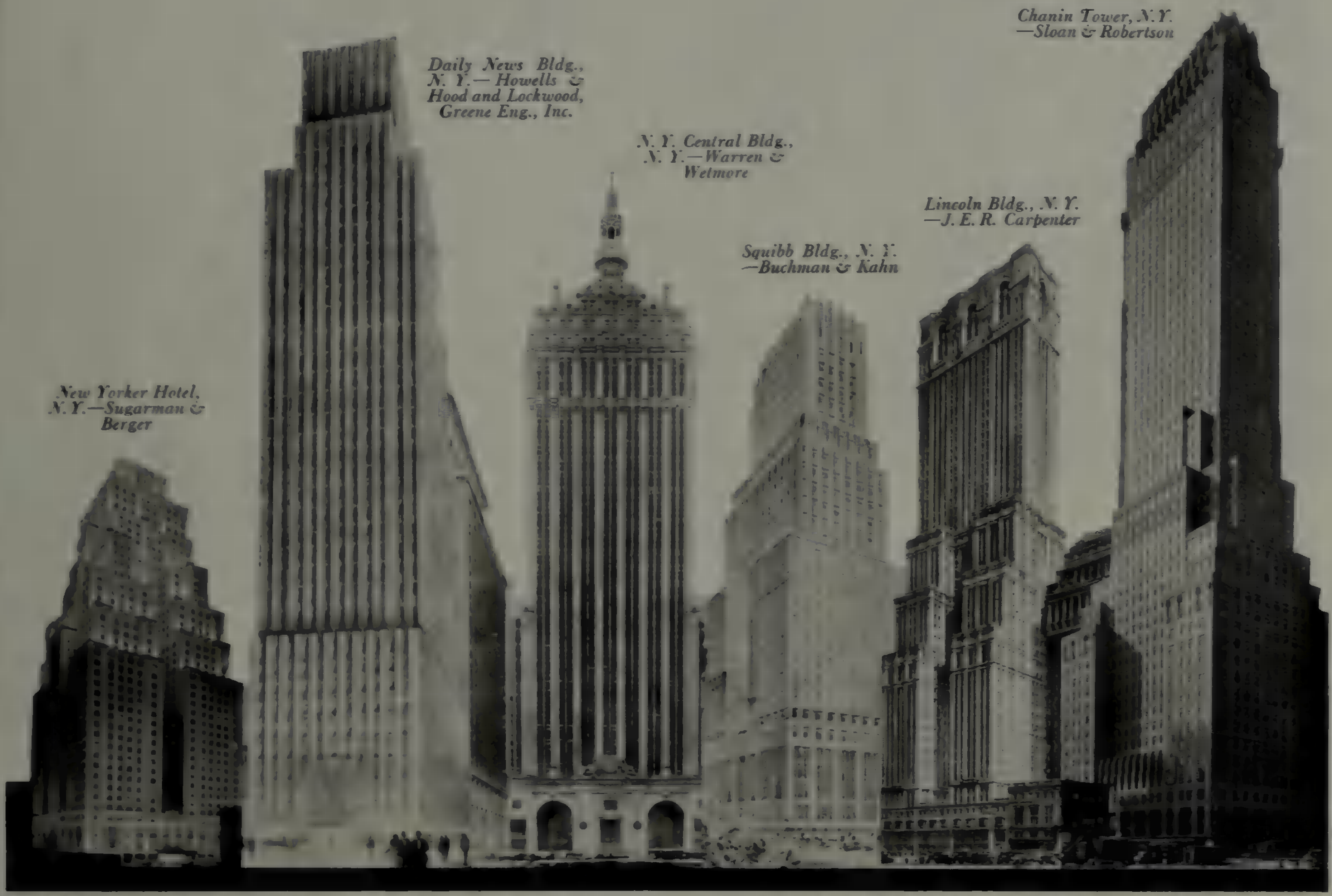
Carrara has the sturdy strength needed for walls and partitions. But it is a decorative as well as a structural material. Carrara's brilliant *beauty* is ideal in carrying out modern decorative effects. In addition, this glass has *hardness,* which makes it impervious to water, chemicals, oils and pencil marks. And *density,* too. It never absorbs dampness—or odors. Its surface is easily kept clean and sanitary.

Carrara can be handled and installed like marble. It comes in slabs of practical sizes. There are three types—Polished Black, Polished White, and Frostex, which is the white glass with a rippled surface. For full information on Carrara Glass and its uses, write to the Pittsburgh Plate Glass Company, Carrara Dept., Grant Building, Pittsburgh, Pa.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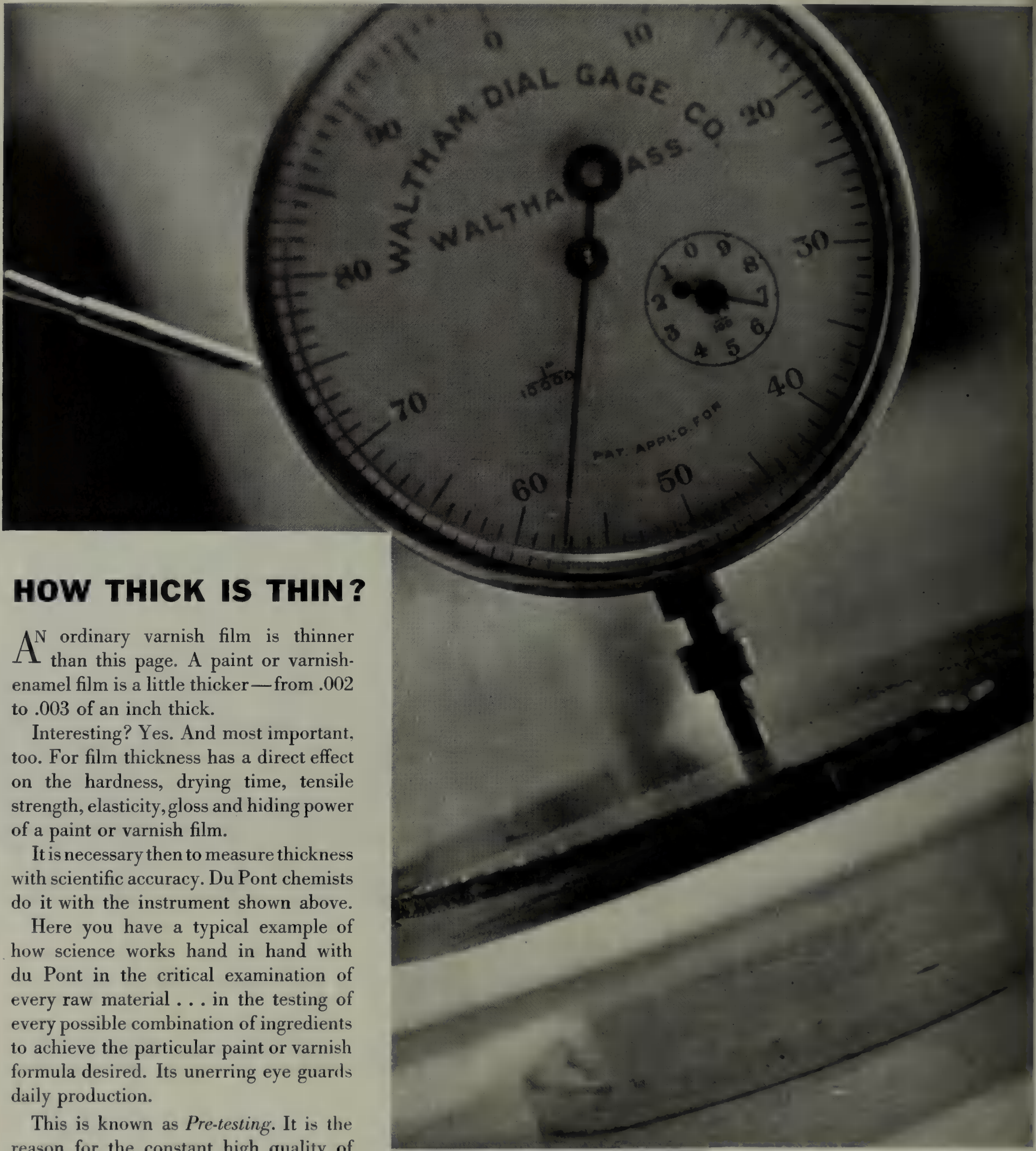
CARRARA

Modern Structural Glass



HOW THICK IS THIN?

An ordinary varnish film is thinner than this page. A paint or varnish-enamel film is a little thicker—from .002 to .003 of an inch thick.

Interesting? Yes. And most important, too. For film thickness has a direct effect on the hardness, drying time, tensile strength, elasticity, gloss and hiding power of a paint or varnish film.

It is necessary then to measure thickness with scientific accuracy. Du Pont chemists do it with the instrument shown above.

Here you have a typical example of how science works hand in hand with du Pont in the critical examination of every raw material . . . in the testing of every possible combination of ingredients to achieve the particular paint or varnish formula desired. Its unerring eye guards daily production.

This is known as *Pre-testing*. It is the reason for the constant high quality of every du Pont finishing product. It gives you confidence in the assertion that du Pont finishes will protect your structures longer . . . will enhance and retain the beauty of your design.

◆ ◆ ◆

We invite your inquiry about du Pont paints, varnishes, enamels, Duco, and other finishing products. Our architectural division is equipped to deal intelligently and quickly with special problems regarding application, decorative effects and technique. Write to Dept. AR11, E. I. du Pont de Nemours & Co., Inc., at any of these addresses: Public Ledger Building, Philadelphia; 2100 Elston Avenue, Chicago; Everett Station No. 49, Boston; 1 Balfour Building, 351 California Street, San Francisco.

DU PONT
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The Paint Film Gauge

The film to be tested is on a glass disc which is inserted under the dial. The combined thickness of the film and the disc is read on the dial. The difference between this thickness and that of the glass disc alone is the thickness of the film. This instrument is accurate to one ten-thousandth of an inch and a reading can be readily estimated to one hundred-thousandth of an inch.

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"Spreads like warm butter"

Tiger "FOOTPRINTS"—Effective Sound Barriers

Another Tiger Job

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AUDITORIUM—Y. W. C. A.
Scranton, Pa.

Architect
J. D. Leland, Boston, Mass.

Plastering Contractors
Mann & Behlke, Scranton, Pa.

Falling silently on the jungle trail, the cushioned paw of the Tiger records a distinguishing imprint that always commands respect. Similarly, silence characterizes the "Footprints" (textures and finishes) of our symbolized Tiger. It is a feature worthy of serious consideration—for sound-proof walls and ceilings are recognized essentials in better buildings.

Identified with fine architecture for more than a quarter century, Tiger Finishing Lime is famous for its exceptional acoustical properties.

The KELLEY ISLAND LIME & TRANSPORT COMPANY
"World's Largest Producer of Lime"
LEADER BUILDING ∴ ∴ CLEVELAND, OHIO

The Famous TIGER FINISH

And—Tiger Mason's, Tiger Agricultural, Tiger Chemical, Tiger All-Purpose Hydrate in 10-lb. packages, and High Calcium and Magnesium Lump Limes. Also Quickslake (ground quicklime) in paper-lined jute sacks.

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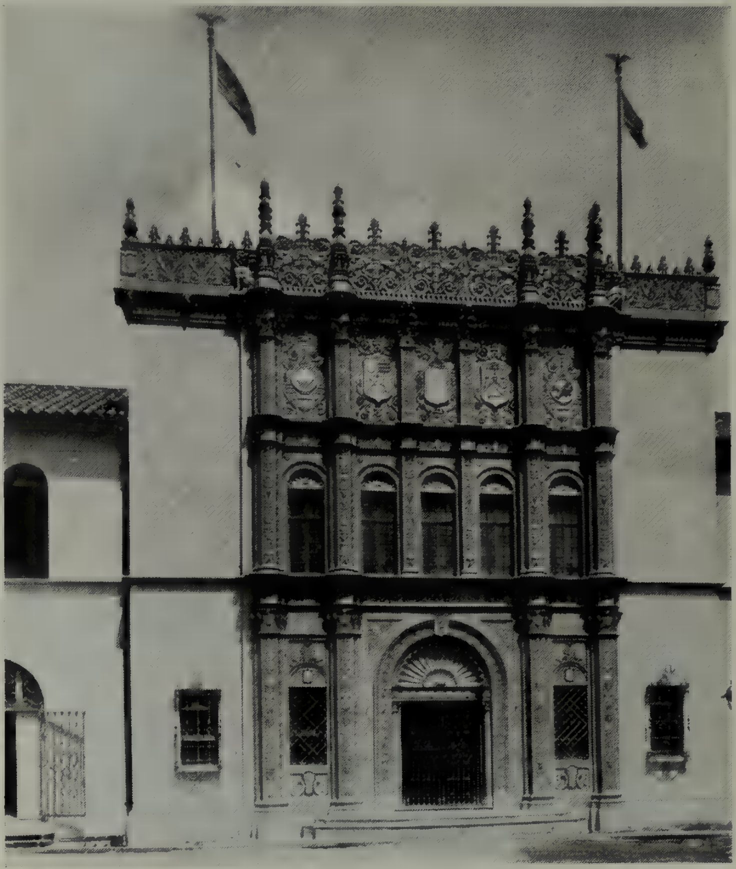
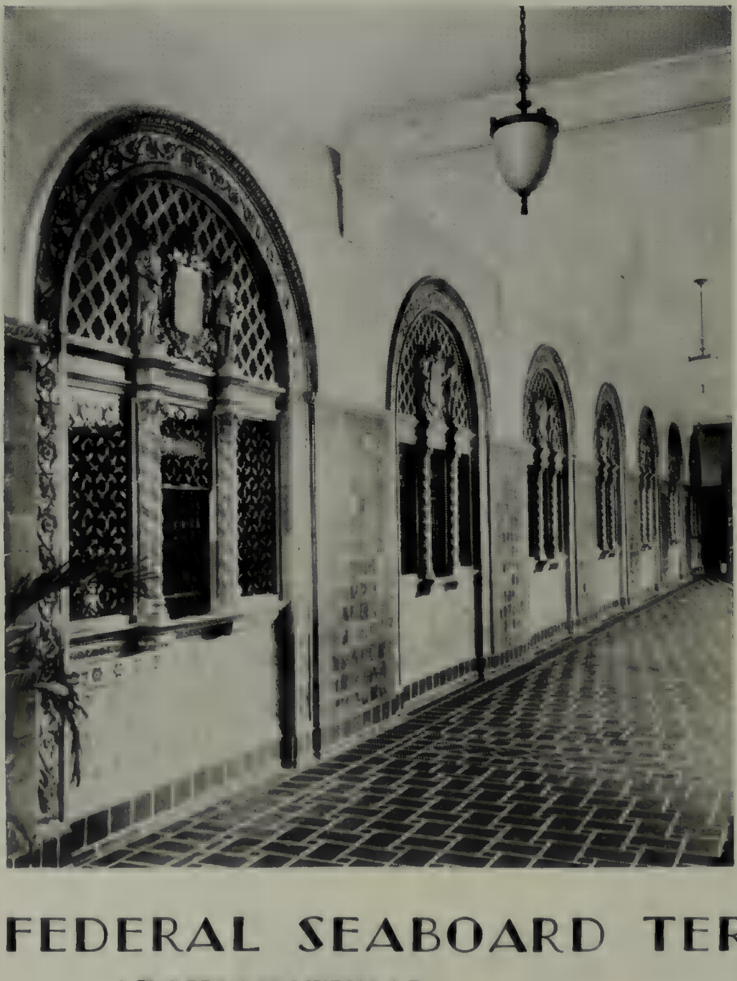


THE UNITED STATES CUSTOMS HOUSE
San Juan, Porto Rico
Albert B. Nichols . . *Architect*
J. C. Besosa . . . . . *Builder*



NO known material is better adapted to Spanish architecture than terra cotta. This applies to its interior as well as exterior use. Of the two illustrations of the United States Customs House at San Juan, Porto Rico, the one at the top shows Federal Seaboard Terra Cotta in full polychrome as an exterior material. Below, an interior of the same building, the pierced terra cotta grilles and delicate tracery again reflect the architecture of Spain. In all parts of this country and in many other parts of the world there is a constantly growing list of important buildings in which Federal Seaboard Terra Cotta supplies the color and form with the maximum of economy.

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The "King" Caesar House, Duxbury, Mass., built of White Pine in 1794, and standing today

GOOD FRIENDS • STILL PASS THROUGH THE WELCOMING DOORWAY

NO ONE would ever call the house pretentious . . . but it is honestly built. Stairways are beautifully proportioned . . . paneling and woodwork put together with care . . . the charming door still swings firmly inward, with its courteous, welcoming gesture.

To one acquainted with Colonial architecture, it is not at all surprising to discover that this delightful home was built of White Pine a few years after the Revolutionary War, and is in excellent condition today. The almost perfect state of preservation witnesses not only to the quality of the wood, but to the intelligence and foresight of the craftsmen who selected it.

And Idaho (genuine) White Pine may be used in the homes you plan! Characterized by a delicate straight grain, and a uniformly soft texture, this beautiful lumber takes a high finish and can be stained and waxed with fine effect. It is easy to work and to handle. And because of its low density cell structure, Idaho White Pine has splendid insulating properties.

To almost every building task, within a house or on the exterior, Idaho White Pine brings a freshness and beauty few other finishes approach. For paneling, with a light enamel treatment . . . a supply cupboard . . . a real playroom for the children . . . a dining-room alcove in the modern manner . . . whatever the work, Idaho White Pine will prove most acceptable.

Good lumber yards carry an ample supply of Idaho (genuine) White Pine. Specify it by name. Western Pine Manufacturers Association, Portland, Oregon.

IWP

This trade-mark is imprinted on Idaho White Pine at the mills—and is a definite protection for home owner, builder, architect and lumber dealer.

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Doctor's Hospital, New York
Crow, Lewis & Wick, Arch's—T. J. Byrne Co., Inc., Plbg. Contractors

No. 626

An attractive recessed Vitreous China Wall Type Fountain used in the building shown. Practical automatic stream control, two-stream projector —water always uniform in height regardless of pressure, no lips need touch or contaminate source of supply!

This NEW YORK HOSPITAL

. . . takes its place among the most modernly equipped in the country. It is only logical that, in line with the completeness of its appointments and conveniences, the architects should choose Halsey Taylor Drinking Fountains for installation throughout. ▪ See Sweet's, or write for details of our line—plain or colored! ▪ The Halsey W. Taylor Company, Warren, Ohio.

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DRINKING FOUNTAINS

Did This Ever Happen to You
...or your clients?

Hey! What's the idea of hitting him in the eye—he wanted a drink, not a shower.

Well, well, where's the water? Oh, there it is, so low his lips will have to touch the jet—and that's serious—it's unsanitary.

The child, bless her heart. She likes to mess things up. You did, too, when you were her age. There goes the water squirting on the walls and the floor.

BUT—when Halsey Taylor Drinking Fountains are installed, there are none of these annoyances to you or your client,—because of practical, patented

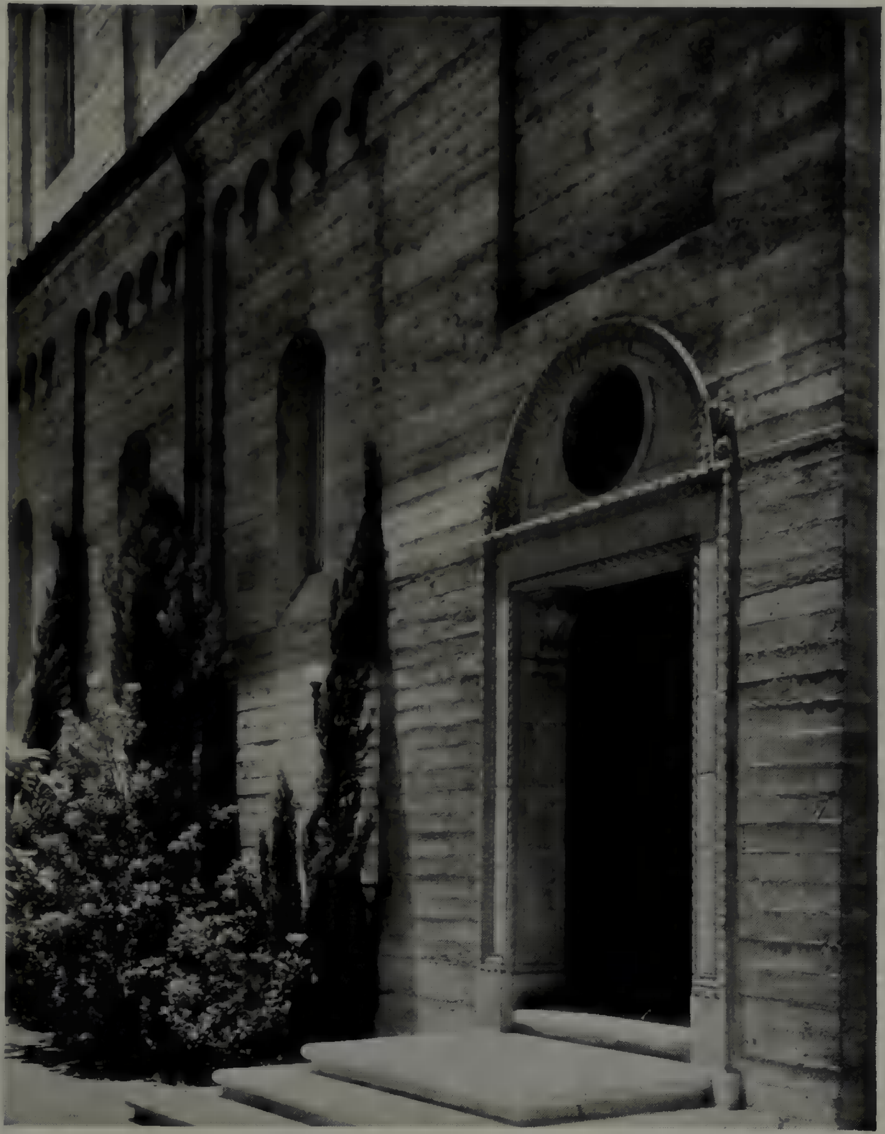
AUTOMATIC STREAM CONTROL AND TWO STREAM PROJECTOR

▼

PIERPONT & W. S. DAVIS,
ARCHITECTS, LOS ANGELES

THERE IS AN INTERESTING IRREGULARITY TO A MONOLITHIC SURFACE WHEN THE CONCRETE IS UNTOUCHED AFTER THE FORMS ARE REMOVED

Concrete builds the complete structure



Because it can be moulded at will, concrete provides a building material that meets nearly every architectural and structural requirement. In fact, it considerably *extends* the architectural possibilities. It combines the richness of hand-tooling with the speed and economy of reproduction from models, permitting decorative motifs which might otherwise be prohibitive in cost.

Consequently, a new era in building decoration—both interior and exterior—is being introduced. Concrete has the enduring characteristics of stone. It can be finished in any color and texture desired.

Portland cement, and the other ingredients which go to make concrete, are readily available in any part of the country. Rapid construction is possible, hence time and labor costs are often lower than with other building materials. The economy—plus the *firesafety* which concrete affords—is rapidly establishing concrete as the complete building material.

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Concrete for permanence and firesafety

33 WEST GRAND AVENUE
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THE BILTMORE HOTEL, LOS ANGELES, CAL.

Parlor in Biltmore Hotel Addition, Los Angeles, Cal. designed by Schultze-Weaver Co. of New York, architects. Built by Scofield Engineering Construction Co. and painted by Arenz-Warren Co. Fourteen tons of Dutch Boy White Lead were used on the Hotel Biltmore Addition.

Another famous West Coast Hotel "CARRIES ON" *with* DUTCH BOY!

BACK in 1923 when the Biltmore was erected, Dutch Boy White Lead was used in the decoration of its beautiful interior.

The paint made with Dutch Boy stood up so well—proved so durable, washable and economical that, when the addition was built in 1927, Dutch Boy was also used in the decoration of the new part of the hotel. And for maintenance work, it's being used throughout the hotel today!

That's the way it goes all over the country—north, south, east and west. Building managers, owners and others responsible for the continued good appearance of much-used corridors, rooms, etc., specify Dutch Boy White Lead for painting jobs that must retain their good appearance in spite of repeated washings.

Not only does Dutch Boy make paint that is well-known for its durability, but this white lead is also extremely adaptable. Mixed with Dutch Boy flatting oil, it provides a washable interior wall paint. Dutch Boy can also be used to obtain economical paint for wood, plaster, wall board or metal . . . undercoatings for enamel . . . or the blended and mottled effects now so popular.

Other uses for Dutch Boy White Lead are suggested in the booklet "Decorative Possibilities of Paint." Why not send for a copy today? Address nearest branch.

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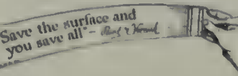
New York, 111 Broadway; Buffalo, 116 Oak St.; Chicago, 900 W. 18th St.; Cincinnati, 659 Freeman Ave.; Cleveland, 820 W. Superior Ave.; St. Louis, 722 Chestnut St.; San Francisco, 2240-24 St.; Boston, National-Boston Lead Co., 800 Albany St.; Pittsburgh, National Lead & Oil Co. of Pa., 316 Fourth Ave.; Philadelphia, John T. Lewis & Bros. Co., Widener Building.

Typical bedroom in Hotel Biltmore, Los Angeles, Cal. painted with Dutch Boy White Lead.

DUTCH BOY WHITE LEAD

The well-known brand of Carter White Lead is also made by the National Lead Company. In purchasing either Carter or Dutch Boy White Lead, the buyer is assured of obtaining white lead of the highest quality.

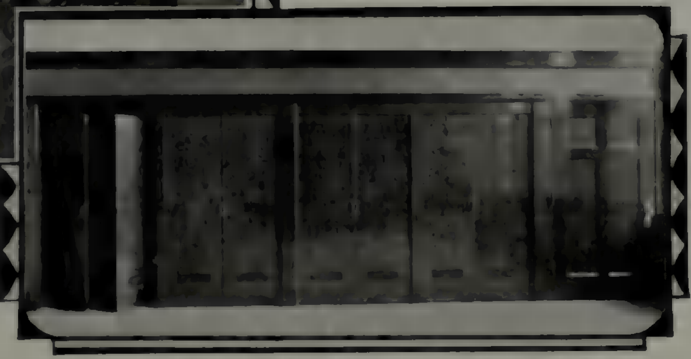

"Save the surface and you save all"

Wilson

HYGIENIC SCHOOL WARDROBES

What Good are Cloak Rooms Anyway?

Showing installation in class room of Belmont, Mass. High School. Note how doors do not block aisle when wardrobe is open.



These Wilson disappearing door wardrobes were installed in College Hill Public School, Cincinnati. Elzner & Anderson, Architects.

THE old-fashioned cloakroom has served its purpose, for the most part in demonstrating the useless construction expense attached to a separate walled-in enclosure, its unsanitary characteristics and as an obstacle in the path of educational efficiency.

Wilson Hygienic Wardrobes become an integral part of the class room, but without undesirable encroachment on valuable floor space.

In the Disappearing Door type, the doors, when open, protrude but 2½ inches into aisle space, folding easily and neatly to the sides of the individual cabinets.

They may be set against the wall or be installed in a convenient recess.

They can be made to conform to any special interior finish, the upper parts of the doors provided with blackboard surface that meets with no interference from clothes inside.

Wilson Hygienic Wardrobes can be connected to the ventilating system, providing hygienic conditions.

They are constantly under the teacher's eye, promoting discipline.

Besides these advantages, they conserve construction funds, saving, for example, $120 to $187 in a room 29'x22'x12'.

Wilson Wardrobes are made by pioneers in this field, proving their superiority during 50 years of service. They are installed under our own supervision and are guaranteed for one year.

For full details as to advantages, descriptions, etc., including the Wilson Rolling Front type for small schools with limited construction appropriation, send for catalog No. 1.

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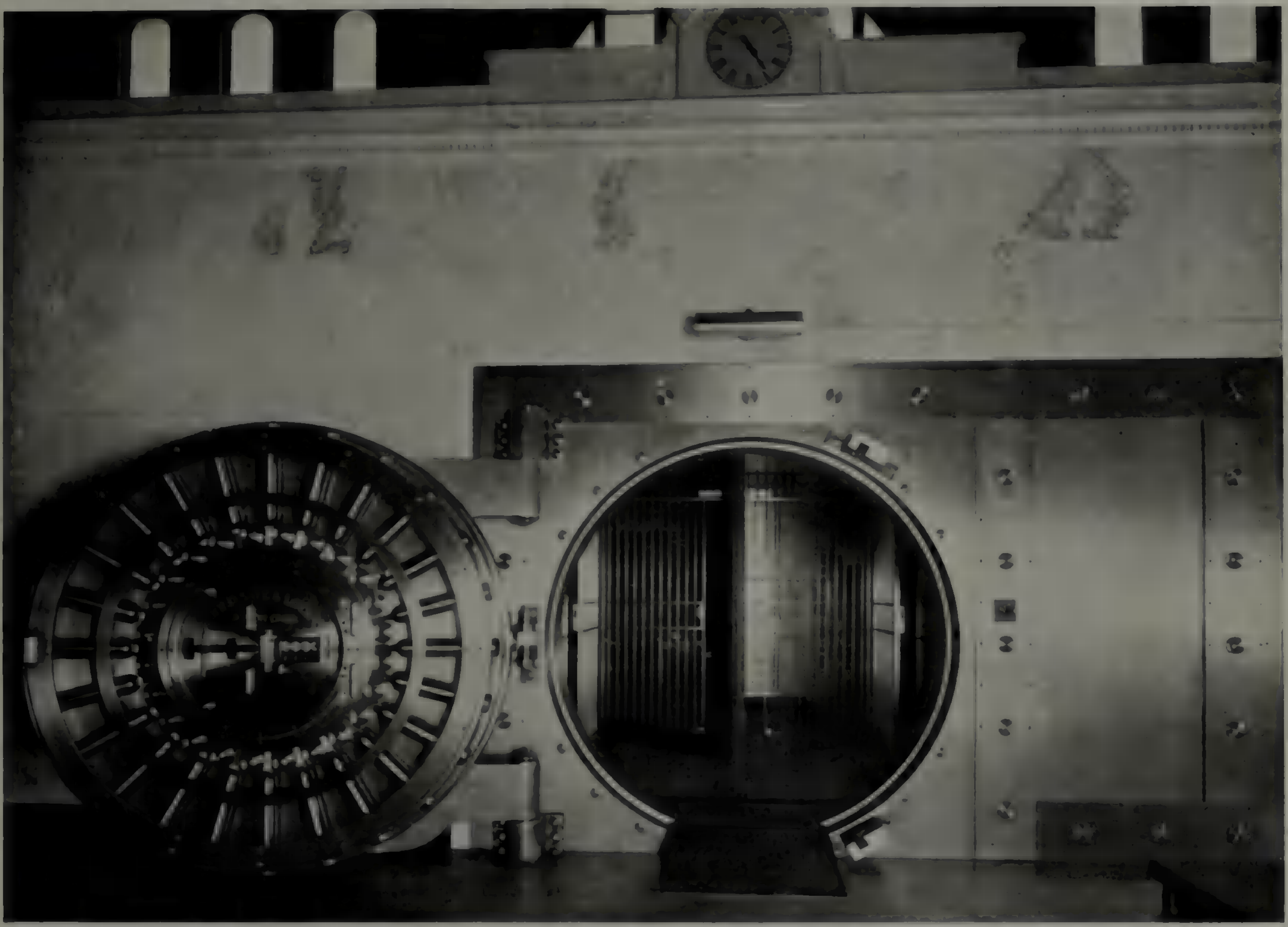
Place a Diebold Vault where people can see it



Here is harmony that can only be attained through cooperation between vault company and architect

THERE is physical attraction in the giant-like build of a Diebold Vault Door and Vault. People like to marvel at the craft that could build a room and a door in steel—nickeled steel that smiles back at them as they look at it. People like to think of this massive thing guarding their possessions. Place a Diebold Vault where people can see it—for there it will add to the appearance of the building.

Diebold Safe and Lock Company

Canton, Ohio

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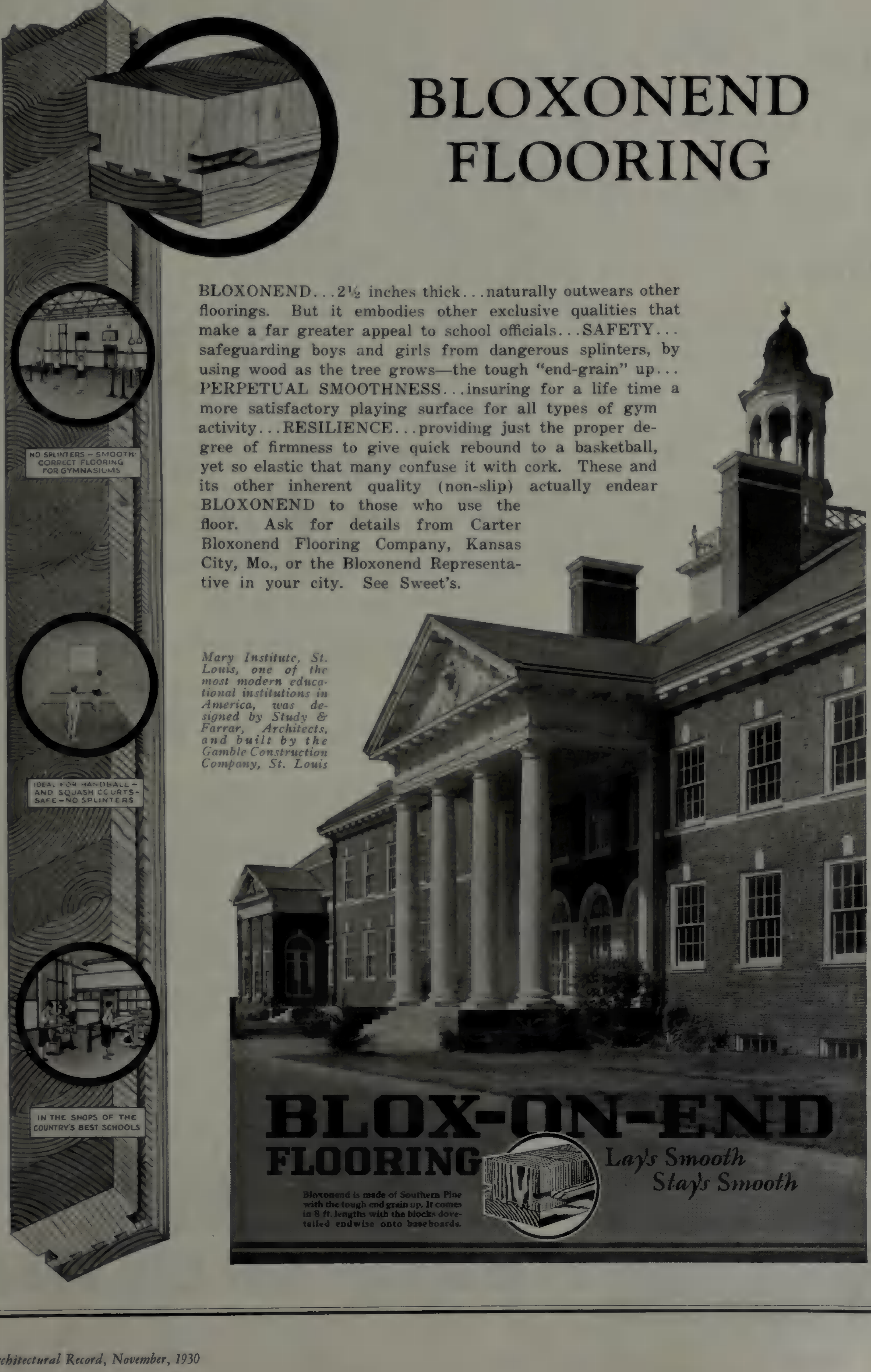

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BLOXONEND...2½ inches thick...naturally outwears other floorings. But it embodies other exclusive qualities that make a far greater appeal to school officials...SAFETY... safeguarding boys and girls from dangerous splinters, by using wood as the tree grows—the tough "end-grain" up... PERPETUAL SMOOTHNESS...insuring for a life time a more satisfactory playing surface for all types of gym activity...RESILIENCE...providing just the proper degree of firmness to give quick rebound to a basketball, yet so elastic that many confuse it with cork. These and its other inherent quality (non-slip) actually endear BLOXONEND to those who use the floor. Ask for details from Carter Bloxonend Flooring Company, Kansas City, Mo., or the Bloxonend Representative in your city. See Sweet's.

Mary Institute, St. Louis, one of the most modern educational institutions in America, was designed by Study & Farrar, Architects, and built by the Gamble Construction Company, St. Louis

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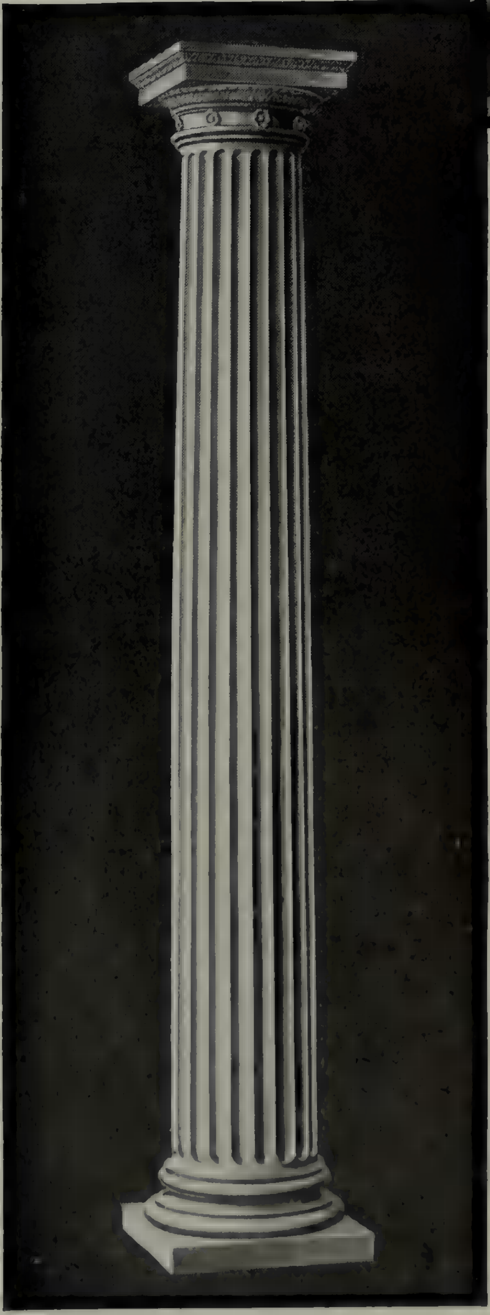
Lays Smooth Stays Smooth

Bloxonend is made of Southern Pine with the tough end grain up. It comes in 8 ft. lengths with the blocks dovetailed endwise onto baseboards.

The Beauty of the Past Lives in Pressed Steel Columns

Residence of Edward S. Blick, Esq., Beverly Hills, Birmingham, Mich.
Architect and Builder: Walter Mast. Union Metal Columns No. 224.



Union Metal Columns No. 224—Roman Doric. One of ten classical designs made in heights from 5′ to 35′ and in diameters from 8″ to 42″.

TYPICALLY American, the Colonial entrance has come down to us as one of our most valued national architectural forms. To best express the charm and dignity which is a part of the Colonial tradition, Union Metal has developed a series of pressed steel columns.

These columns have sharp, clean-cut lines, perfect architectural details. In the wide range of styles there are columns which will impart time-tested beauty to all types of buildings from the small home to the imposing public structure.

But aside from the artistic achievements which are possible, there is the important advantage of economy. Union Metal columns are low in first cost and are free from the warping, rotting and splitting troubles peculiar to the ordinary type of column. Once installed, they are good for a lifetime of service.

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WELDED STEEL PIPE

BASIC
COVERING CHROME-
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THE CHEMICAL

Patent Number:	1,316,817
Inventor:	Benno Strauss
Expiration Date:	September 23, 1936
Title of Patent:	Articles which require high resistance against corrosion.

Patent Number:	1,339,378
Inventor:	Benno Strauss
Expiration Date:	May 4, 1937
Title of Patent:	Objects having great strength and great resistance against the action of acids.

Availability of these patents to American industry, by nonexclusive license from
turers, has resulted in the production of Steel Alloys containing Chromium and Nickel
manufacture of articles which require high resistance against corrosion and objects
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Patent No. 1,316,817 covers:

CLAIM 1. Articles which require a high resistance against corrosion said articles being made from a steel alloy containing 6% to 25% chromium, 20% to ½% nickel and not over 1% carbon, the proportion of chromium increasing as the proportion of nickel decreases and vice versa.

CLAIM 2. Articles with a high resistance against corrosion which require to be unmagnetic, said articles being made from a steel alloy containing 8% to 25% chromium, 20% to ½% nickel and not over 1% carbon, the proportion of chromium increasing as the proportion of nickel decreases and vice versa.

Patent No. 1,339,378 covers:

CLAIM: Articles having great strength and great resistance against the action of acids, said articles being made from a steel alloy containing from 15% to 40% chromium, 20% to 4% nickel, not over 1% carbon and not less than 55% iron.

The Chemical Foundation, Incorporated, and extensive research by American manufac-
within the ranges specified in these patents. These alloys are available for the
having great strength and great resistance against the action of acids, and must be
these alloys against all claims for infringement.

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They Wanted Quiet Classrooms . . .
so they used Armstrong's Cork Tile

EDUCATORS realize that silence is essential to perfect concentration. So modern school construction generally includes materials that muffle sound. St. Paul Academy, of St. Paul, Minn., for example, lessens the sound of scuffling feet and subdues the strident note of scraping chairs with comfortable, quiet Armstrong's Cork Tile.

But that's only one of the many reasons why Cork Tile was the floor chosen for the library of this school. Decorative beauty is another.

Armstrong's Cork Tile is made in three warm shades of brown. It is possible to obtain unusual effects by combining two or three of the shades in various patterns. And since the tiles are made in thirty-one different sizes the floor design can be custom-made and custom-laid. Whatever your floor needs might be, here's a floor that you'll want to consider.

Armstrong's Cork Tile has remarkable wearing qualities and, when properly cared for, will give years of flawless service. If lacquered when laid, an occasional light waxing and polishing is all the attention needed to keep it in perfect condition.

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Guarded by

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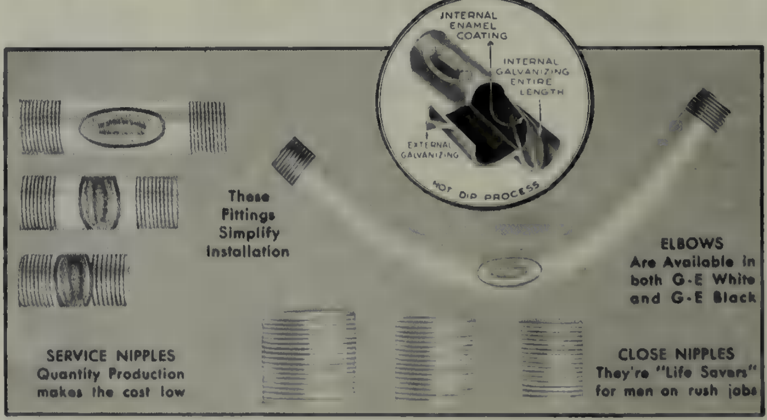
INTERNAL ENAMEL COATING
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These Fittings Simplify Installation
ELBOWS Are Available in both G-E White and G-E Black
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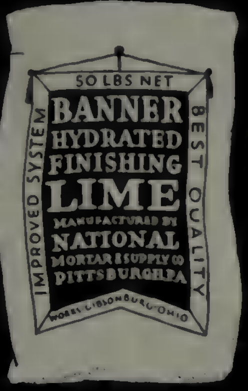

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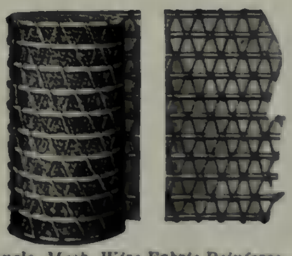
Wire Fabric being laid on floors of Carew Tower



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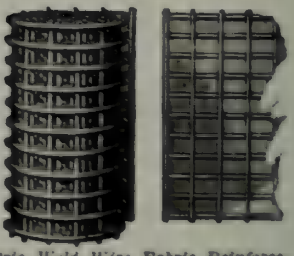

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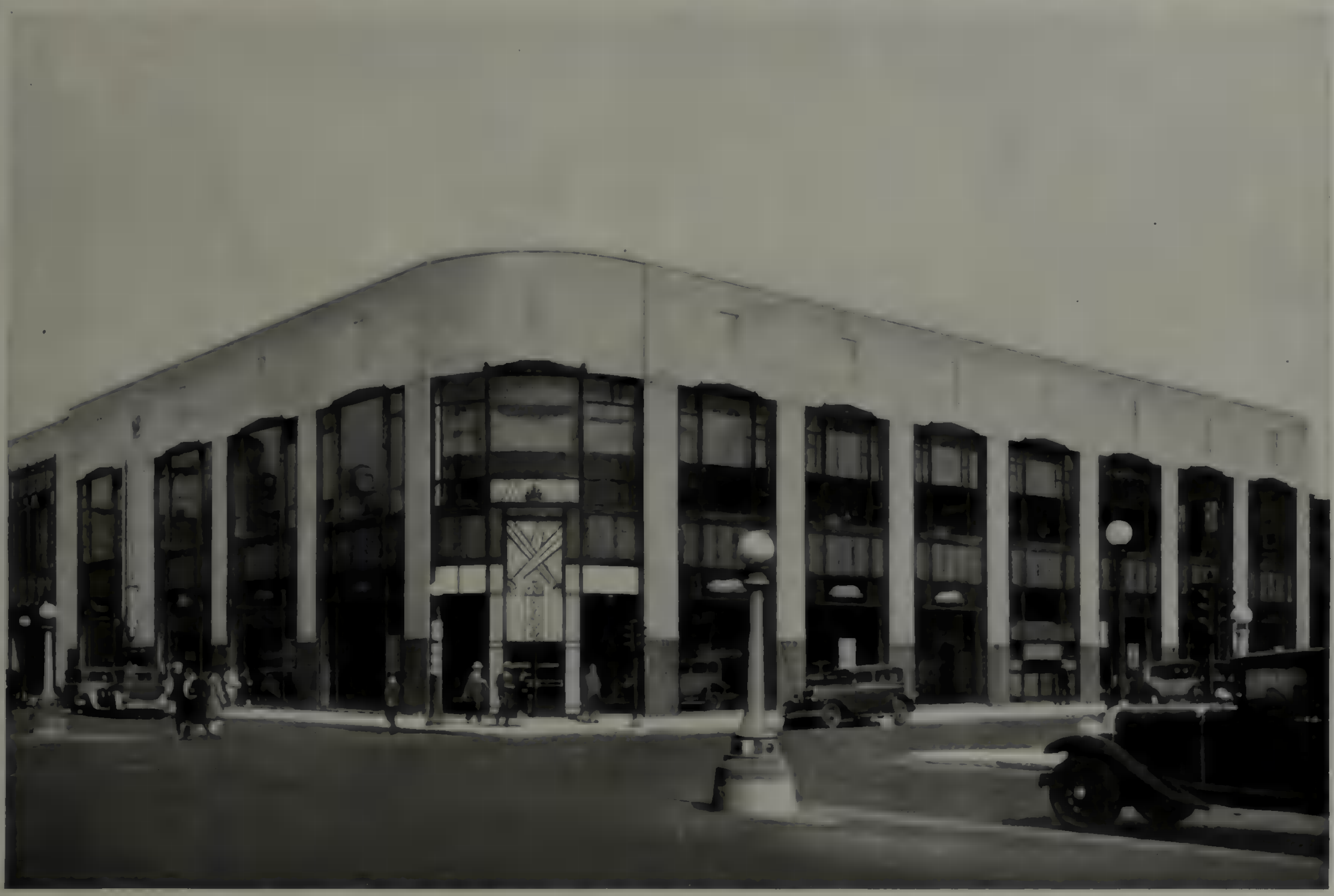
CHICAGO STUDEBAKER SALES BUILDING



The Chicago Studebaker Sales Building, Chicago, Illinois. Loewenberg and Loewenberg, Architects

A REPRESENTATIVE CRITTALL INSTALLATION

AN INTERESTING example of the adaptability of Crittall Casements to commercial buildings and shops is furnished by the Chicago Studebaker Sales Building.

To this type of architecture they bring many advantages. They permit the openings to be used for light, display and ventilation. And in addition they provide beauty that contributes much to the effectiveness of the design.

Crittall Casements are offered in three complete and separate lines. Stanwin and Norman Casements are available in a wide variety of standardized sizes—Universal Casements are custom-built in steel or bronze to the architect's own specifications. The world's largest manufacturer of metal casements—with factories all over the globe—Crittall can furnish windows for every type of construction.

See our complete catalog in Sweet's—pages A1131 to A1200—for complete details and specifications of all windows in the Crittall line.

CRITTALL CASEMENT WINDOW COMPANY
10945 Hern Avenue , , Detroit, Michigan

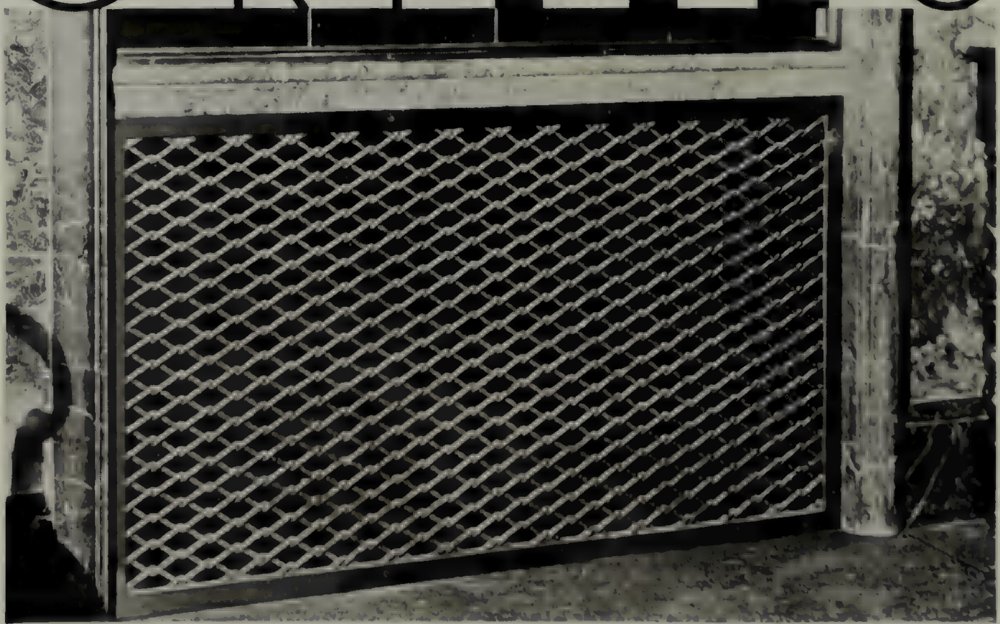
STANWIN CASEMENTS , NORMAN CASEMENTS , UNIVERSAL CASEMENTS

CRITTALL CASEMENTS

At the left is pictured the Y. M. H. A. Building at 92nd St. and Lexington Ave., N. Y. C. . . Architect—Necarsulmer & Lehlbach, N.Y.C.; General Contractor—J. H. Taylor & Co., N. Y. C.; Mechanical Engineers — Jaros & Baum, N. Y. C.; Heating Contractors — Wolff & Munier, Inc., N. Y. C. . .

Highton, Hart & Cooley Grilles in Hitoncast Rope Design No. 91, as shown below, were installed.

HIGHTON
HART & COOLEY
GRILLES



The outstanding facility of Wm. Highton & Sons—division of Hart & Cooley—in producing ornamental grilles of special design has proved of great value to those architects desiring to lift their buildings out of the commonplace. Here is a company that has been producing truly beautiful grilles for over 70 years — adhering steadfastly to old-time standards in the matter of finish, yet always outstandingly progressive in the creation of new designs . . . No question but that today the Highton line is the most complete which exists in this country. It embraces ornamental grilles in cast iron, cast bronze, cast aluminum —in steel, wrought bronze and perforated aluminum . . . ventilating registers in an extremely wide variety of designs, styles and finishes . . . To fully appreciate this line see our insert in SWEET'S or, better still, send for our Catalogue No. 29 . . . .

WM. HIGHTON & SONS
Division of
HART & COOLEY MFG. CO.
NASHUA, NEW HAMPSHIRE

BRANCHES IN BOSTON, NEW YORK
PHILADELPHIA AND CHICAGO . . .
AGENCIES IN ALL PRINCIPAL CITIES

The New Dahlquist Turbo-Aquatherm

(U. S. Patent No. 1,762,215, June 10, 1930)

Automatic Gas Unit with Side Arm

Experts have long recognized that the ordinary hot water boiler serves as an efficient sediment trap. This is due to the fact that it contains a relatively large volume of quiet water and hence any sediment or insoluble matter which normally remains in suspension in the water lines gradually sinks to the bottom of the boiler.

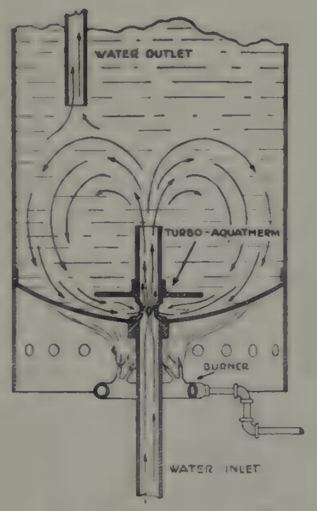
This continual accumulation of sediment is one of the greatest enemies of the efficient satisfactory operation of the hot water boiler. If allowed to accumulate long enough it will cause surges of muddy water in the hot water line and in the case of underfired or automatic storage units, it forms an insulating blanket on the bottom between the water and the metal itself which is the greatest cause of burnouts. Furthermore hot water accumulated in the ordinary boiler becomes stagnant and unsuitable for domestic purposes.

The TURBO-AQUATHERM

(U. S. Patent No. 1,762,215, June 10, 1930)

In order to absolutely prevent the accumulation of sediment which is the great enemy of the efficiency and life of hot water boilers, Theodore W. Dahlquist has invented a device called the TURBO-AQUATHERM which takes advantage of the velocity of the incoming cold water to create a suction and a whirl which constantly sweeps and scours the bottom of the boiler carrying every particle of foreign matter out of the system. No sediment can ever accumulate in the Dahlquist TURBO-AQUATHERM Copper Boiler and the water is always as fresh as that in the cold water lines and may be safely used for cooking as well as for other household purposes. Furthermore the danger of burnouts in automatic storage and underfired systems is eliminated and the thermal efficiency of the boiler is greatly increased. The accompanying sketch shows clearly the action of the TURBO-AQUATHERM which may be had with little additional cost on all Dahlquist range boilers and automatic storage systems.

Write now for full particulars regarding this revolutionary improvement in hot water boilers.



Arrows show action of water when drawn thru TURBO-AQUATHERM scouring bottom of boiler and preventing any accumulation of sediment

Super-aquatherm Gas Underfire

Automatic Electric Unit

Ask for full information regarding the Dahlquist complete line of copper range boilers. Copper, gas, electric and oil combinations. Copper, automatic storage systems and large industrial units for all purposes

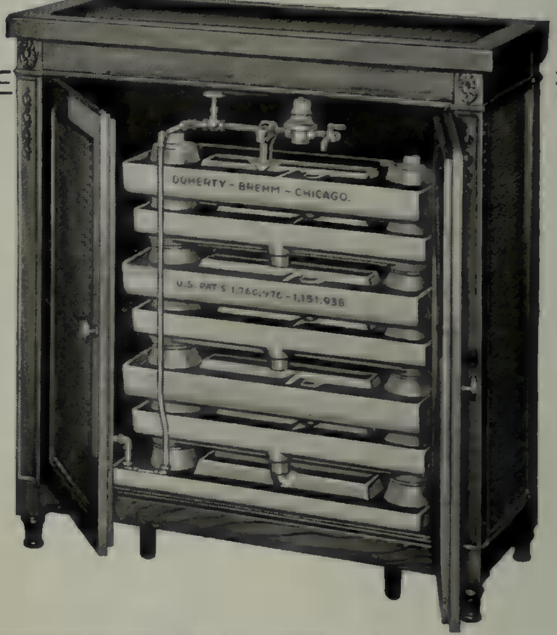
Dahlquist Mfg. Co.

30 West 3rd Street
So. Boston, Mass., U. S. A.

NOW · · moist air [HUMIDITY] *for every radiator-heated building!*

AS LOW AS $150 Easy payments if desired

(F. O. B. FACTORY . . . INSTALLATION EXTRA)



Master craftsmen have produced beautiful wood cabinets for the Doherty-Brehm Humidifier. Also in metal cabinet and for recessing. In metal cabinets, $150 to $225. In wood cabinets, $245 to $340. Prices, f. o. b. factory, installation extra.

Ingenious Humidifier banishes dry winter air . . . the cause of discomfort, colds, and cracked furniture!

FOR years engineers have tried to overcome winter dryness with radiator heating. At last they have succeeded; the Doherty-Brehm Radiator Humidifier is the first and only successful low-priced humidifier. Automatic, silent, it supplies plenty of moisture to the air in any home with radiator heat—steam, hot water, or vapor.

Essential for comfort and health

Into hundreds of fine homes it is now bringing the breath of spring all through the months of winter. Fresh, moist air in every room; no dry, hot air to invite colds, sinus troubles, mastoids, and other winter ills; to wilt plants and flowers; to crack and blemish furniture, floors, and woodwork.

One Humidifier sufficient for average home

To provide this comfortable and healthful atmosphere, the Doherty-Brehm Radiator Humidifier evaporates just the right amount of water—1 to 100 gallons a day, as may be needed! Positive automatic control; no moving parts to get out of order. There is a size and type for every home heated with radiators. *One of these humidifying radiators centrally located will properly moisten the air in an entire house or individual apartment.* Extra units take care of a building of any size.

Beautiful cabinets—Easy installation

Doherty-Brehm Radiator Humidifiers are enclosed in pleasing cabinets widely varied to harmonize with any kind of interior decoration. Each is both a heating and humidifying unit, simply and quickly installed, and maintained without attention.

Sold on the CRANE *Budget Plan*

The Doherty-Brehm Radiator Humidifier is sold by **CRANE** through dependable heating and plumbing contractors everywhere. Your clients can buy it under *the* **CRANE** *Budget Plan and pay only 10% down, the rest monthly.* Specify it for new buildings. Recommend it for modernized ones.

Mail Coupon for A. I. A. File Book

You should have this book in your A. I. A. file. If you haven't it, mail the coupon at once.

DOHERTY-BREHM CO.
333 North Michigan Ave., Chicago, Ill.

Please send your booklet about humidity and the Doherty-Brehm Radiator Humidifier, for my A. I. A. file.

Name ....

Address ....

DOHERTY-BREHM HUMIDIFIER

28 years ago

installed in an
Oklahoma Garage

18 years later

*sold by owners—at more than
its original cost—and installed
in a furniture warehouse*

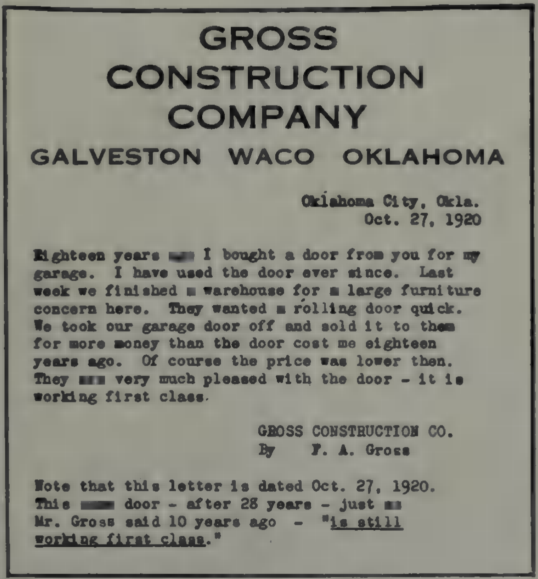
today "working first class"

(see letter below)

PRECISION ENGINEERING

Unusual?

Unusual? . . . Yes — but it is this delivering dependable, satisfactory service, day-in and day-out for years and years and years that has established for KINNEAR Steel Rolling Doors the pre-eminent position they occupy in the rolling door field today. Why be satisfied with anything less than the best—especially when, service considered, KINNEAR Steel Rolling Doors actually cost less? Write for your copy of the illustrated Kinnear catalog and details of Kinnear Engineering and Estimating Service available without cost or obligation.



GROSS
CONSTRUCTION
COMPANY
GALVESTON WACO OKLAHOMA

Oklahoma City, Okla.
Oct. 27, 1920

Eighteen years ago I bought a door from you for my garage. I have used the door ever since. Last week we finished a warehouse for a large furniture concern here. They wanted a rolling door quick. We took our garage door off and sold it to them for more money than the door cost me eighteen years ago. Of course the price was lower then. They are very much pleased with the door - it is working first class.

GROSS CONSTRUCTION CO.
By F. A. Gross

Note that this letter is dated Oct. 27, 1920. This same door - after 28 years - just as Mr. Gross said 10 years ago - "is still working first class."

kinnear
ROLLING DOORS

THE KINNEAR MANUFACTURING CO.
401-451 Field Ave., Columbus, Ohio, U. S. A.
Boston Chicago Cincinnati Cleveland
Detroit New Orleans New York Philadelphia
Pittsburgh Kansas City Washington

"—there ain't no more buff!"

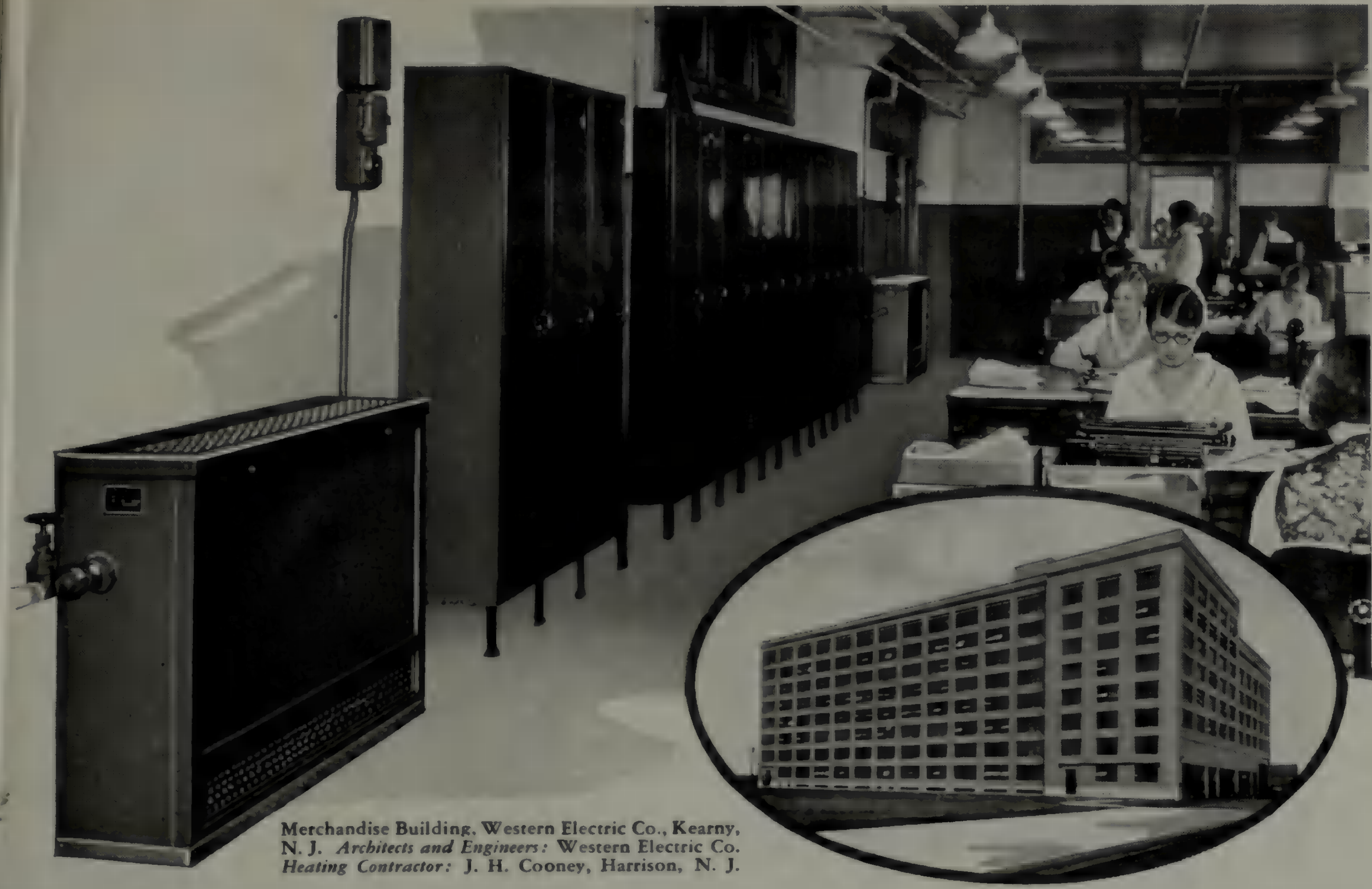
VICTOR OOLITIC STONE CO.
BLOOMINGTON, INDIANA

TO THE ARCHITECTS
OF AMERICA

Every Fall a mysterious rumor is circulated that the supply of Select and Standard Buff has been exhausted – and that if there is any anywhere, the supply is inadequate.

Every Fall we kill this rumor with a statement of the facts, which at this writing are as follows: we have ONE MILLION cubic feet of Buff quarried and ready for shipment – and TWO BILLION more readily accessible.

John Edgeworth



Merchandise Building, Western Electric Co., Kearny, N. J. *Architects and Engineers:* Western Electric Co. *Heating Contractor:* J. H. Cooney, Harrison, N. J.

Western Electric's Merchandise Offices...

heated by 21 Sturtevant Unit Heater-Ventilators

In the average unit heater-ventilator installation, heating is incidental to the primary ventilating function of the equipment. Consequently the advantages of using these units *solely* as recirculating heaters are often overlooked. These advantages are quick, uniform heating . . . close control of temperature . . . economy in operation.

A typical instance of efficient heating by recirculation is provided by the 21 Sturtevant Unit Heater-Ventilators in Western Electric's Merchandise Building at Kearny, N. J.

Since this equipment mechanically circulates the heated air, the offices are evenly heated throughout. There are no hot or cold spots. Desired room temperature is maintained by automatic control. Sturtevant Unit Heater-Ventilators heat more quickly than direct radiation . . . and give 6 to 10 times more heat! So the offices are quickly heated in the mornings . . . even Monday mornings! No need to keep heat up overnight or over the weekend. Sturtevant Unit Heater-Ventilators are adapted either to hot water heating . . . which is the system used in this building . . . or to steam. In the latter case, there is usually a worthwhile saving in steam, over direct radiation. The units are quiet and unobtrusive . . . both in operation and appearance.

Sturtevant Unit Heater-Ventilators are adapted to infinite installations . . . schools, stores, hotels, institutions and other places. Have you Catalog 361?

B. F. STURTEVANT COMPANY
Main Offices: HYDE PARK, BOSTON, MASSACHUSETTS; CHICAGO, ILLINOIS, 410 No. Michigan Avenue; SAN FRANCISCO, CALIFORNIA, 681 Market Street
Branch Offices in Principal Cities: Canadian Offices at: Toronto, Montreal and Galt. Canadian Rep.: Kipp Kelly, Ltd., Winnipeg. Agents in Principal Foreign Countries.

Sturtevant Unit Heater-Ventilator
Reg. U. S. Pat. Off.
SUPPLIES OUTDOOR AIR ~ FILTERED CLEAN ~ AND TEMPERED

This beautiful portfolio of plates

should be in the files of every architect specializing in

Residences
Schools
Universities
Hospitals

...in fact wherever greenhouses are used

32 photographs of some of the finest greenhouse layouts in the country. On the reverse side of each is a ground plan and complete description of the job.

A request on your letterhead will bring you a copy free of charge.

King Construction Company
315 Wheatfield Street N. Tonawanda, N. Y.

Includes King Greenhouses on estates of—

Eugene Du Pont
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J. P. Morgan
E. G. Grace
P. D. Armour

and others of equal prominence

OUR CATALOGUE IS FILED IN SWEET'S

Casements *Opened, Closed, Locked without touching Inside Screens . . . .*

Specified by Chicago Architect for his Own Home

Living room in the house of William B. Betts, Architect, Chicago

Dining room in the house of William B. Betts

Attracted by their unique practical advantages which include screen-free operation, William B. Betts, Architect, of Chicago, selected Fenestra Steel Casements equipped with Fenestra Screens for his own home.

Permanent fly tightness is assured by these screened casements, the *flat*, non-warping screen frame making a metal-to-metal contact against the *flat* casement frame.

Construction of Fenestra Casements is by craftsmen in the shops of America's oldest and largest steel window manufacturer. Ask for catalog.

DETROIT STEEL PRODUCTS COMPANY, 2285 East Grand Boulevard, Detroit, Michigan
Factories: Detroit, Mich. and Oakland, Calif.
Convenient Warehouse Stocks

Fenestra
STEEL CASEMENTS (Screened)

THE SQUIBB BUILDING, New York City.

Architect: The Firm of Ely Jacques Kahn, New York City
Consulting Engineer: H. B. Oehrig, New York City
General Contractor: Shroder & Kopel, New York City
Plumbing Contractor: F. B. Lasette, Long Island City, N. Y.
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In a *Worthy Building* for a *Worthy House*

IN the fine neighborhood of the Savoy Plaza, the New Netherlands and the Plaza Hotel, and taking its place rightfully among such neighbors, the new Squibb Building in New York embodies beauty, convenience, and structural soundness, without and within.

Its proportions are lofty and graceful, its external parts all satisfyingly composed, its approaches and immediate setting dignified, its interior rich in effect and interesting in detail.

In such a building, where architects, engineers, and builders have been free to incorporate the best, it is not strange that piping should be carefully considered and that the major tonnage should be NATIONAL—

America's Standard Wrought Pipe

National Tube Co. : Pittsburgh, Pa.
Subsidiary of United States Steel Corporation

US STEEL

NATIONAL PIPE

A Specification that Saves Your Client More than it Costs

The average client about to build a house, knows very little about boilers. He is likely to scan "first cost" from a wrong viewpoint.

He fails to remember that he burns fuel each year equal in cost from one half to the entire original cost of the boiler.

A difference of 15% in efficiency, between boilers, can make a 20% difference in his fuel bill, and he can get his 20% saving every year. An H. B. Smith Boiler, because it has enough Fire Surface to absorb all the heat needed without costly waste, soon pays for itself out of fuel savings. In the course of its lifetime, it pays for itself over and over. The New Smith "16" has more Fire Surface than any other boiler made of the same grate area. It now offers to owners of small-to-medium size homes the same welcome comfort and economy that the larger Smith Boilers (Mills "24", "34" and "44") have been giving owners of large homes and mansions for over fifty years.

Complete information gladly sent on request. Address, The H. B. Smith Co., Dept. E-55, Westfield, Mass.

THE
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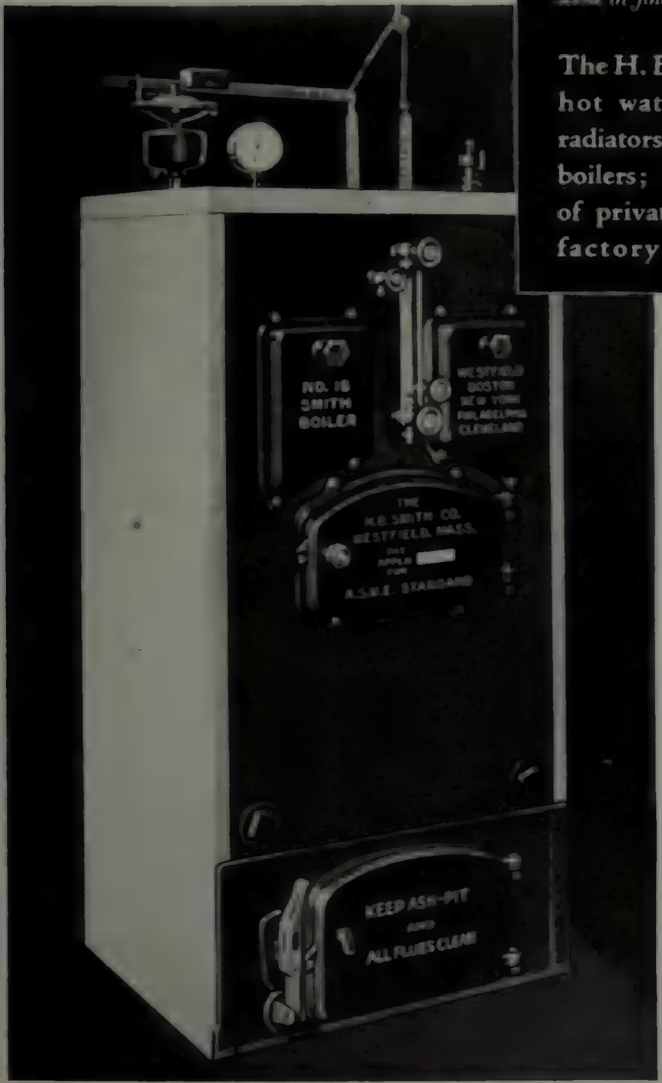
SMITH
BOILERS & RADIATORS
Used in fine homes and buildings since [illegible]

The H. B. Smith Boilers for steam, hot water and vapor heating; radiators; and hot water supply boilers; for every type and size of private home, office building, factory and public building.



SALES OFFICES AND WAREHOUSES

NEW YORK
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A New Booklet on MODERN GRANITE

ARCHITECTURAL
No 1 OF THE GRANITE SERIES 3RD EDITION 1931
GRANITE
NATIONAL BUILDING GRANITE QUARRIES ASSOCIATION, INC, BOSTON, MASS

. . . is ready for your files

SEND FOR YOUR COPY

KNOWLEDGE of what has and can be done in the production and finishing of granite for architectural purposes is more essential now than ever before if full advantage is to be taken of its aesthetic and economic possibilities . . . Revised and modernized to include the latest available information on the subject of modern granite technique, this 28-page booklet is available to architects, designers and specification writers. Of particular interest will be the 23 color reproductions of standard American granites produced by members of the association, as well as the new and important sections devoted to Granite Veneer and Rubble Ashlar. Other sections give valuable information on the subject of detailing and specifying and the sand-blast process of decoration . . . Use the attached coupon for your copy of "Architectural Granite".

NATIONAL BUILDING GRANITE
QUARRIES ASSOCIATION
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Boston, Massachusetts
H. H. SHERMAN, *Secretary*

NATIONAL BUILDING GRANITE QUARRIES ASSN.
31 State Street, Boston, Mass.

Gentlemen:

Please send me a copy of the new issue of "Architectural Granite".

Name____________________________

Address__________________________

UNEMPLOYMENT OF DRAFTSMEN

The decline in building construction has forced many draftsmen out of employment. The situation demands immediate attention, since improvement in the building industry is expected to be gradual.

One solution of the unemployment problem may be the shortening of working hours and the working week, where possible. Another suggestion is the use of spare time to initiate new building projects, to study improved methods of office routine, and otherwise prepare for more efficient service when new business begins to come in.

Steps for meeting unemployment are now being undertaken by various architectural organizations. The cooperation of all architects and others in the allied fields is invited. The Architectural Record asks that suggestions from architects and draftsmen be sent in to be submitted to a committee now being formed to discuss plans for meeting the situation.

CALENDAR OF EVENTS

Nov. 12, 13, 14	National meeting of American Institute of Architects, Detroit.
Nov. 15	"Man and Machines", an exhibit representing western industrial civilization, at Museums of the Peaceful Arts, 220 East 42nd Street, New York City.
Nov. 18-19	Art Exhibition, Royal Institute of British Architects, London (9, Conduit Street).
Dec. 1	Competition for "esthetic improvement" in design of water tanks, sponsored by Chicago Bridge and Iron Works, Alvert M. Saxe, 430 N. Michigan Avenue, Chicago, architectural advisor.
Dec. 1-6	Ninth National Exposition of Power and Mechanical Engineering, Grand Central Palace, New York City.
Dec. 5-6	The Florida Association of Architects will meet at Fort Meyers, Florida.
Dec. 16	Address by Arthur Holden, Junior League of the N. Y. Society of Architects. Apply to L. E. Jallade, 15 East 47th Street, New York City.
Jan.-Feb. 1	International Exhibition of Persian Art, Royal Academy, London.
Jan. 23	Beaux-Arts Annual Ball, Hotel Astor.
Through Feb.	Annual exhibition of the Architectural League of Greater Miami, Florida.
March 30-April 4	House and Garden Exposition, Grand Central Palace, New York City.
April 18-25	Fourth Biennial Architectural and Allied Arts Exposition, Grand Central Palace, New York City.
June	International Town Planning and Housing Federation Congress, Berlin.

ANNOUNCEMENTS

Walter F. Bogner, architect, announces the removal of his office to 45 Newbury Street, Boston, Mass.

Rankin and Kellogg, architects, announce the removal of their offices from 1805 Walnut Street to the Architects Building, 17th Street at Sansom Street, Philadelphia, Pa.

Gerad W. Wolf, architect, announces the removal of his office to Central Building, Clayton, Mo.

Carl F. Pilat, landscape architect of 15 Park Row, New York City, has been appointed landscape architect of the Constructing Division of the War Department. He will continue his general practice in New York and Ossining and conduct the duties of his new office through associates and assistants.

JUNIOR LEAGUE OF THE NEW YORK SOCIETY OF ARCHITECTS

The New York Society of Architects has extended its activities so as to admit into this body an auxiliary organization or Junior League. This is intended to be of benefit to the draftsmen or junior architects who are not yet registered under the law.

The object of this new organization is principally educational and partly social. A program for the winter season covers the following subjects:

The Education of an Architect
The Functions of an Architect and His Relations to the Client
Modern Tendencies in Design
Methods of Studying a Project Beginning with the Sketches
Taking of Estimates and General Practice of Letting Contracts
Supervision of Work in Field
Technique of Writing Specifications
Office Administration, Organization and Cost of Producing Drawings
Selection of Building Materials
Legal Standpoint of the Profession

The work will be directed by Colonel Louis E. Jallade. Admission to the talks will be opened to all draftsmen who are interested, applying to Louis E. Jallade, 15 East 47th Street, New York City.

THE DECEMBER ISSUE

includes
among other features . . .

CRANBROOK ACADEMY, MICHIGAN
ELIEL SAARINEN, ARCHITECT

This academy of art is not only for study but also for work. Painters, architects and craftsmen may come here to develop projects with the benefits of association with other skilled workers. The studios, drafting rooms, experimental workshops, library, museum, lecture rooms and apartments for visiting artists have been designed by Mr. Saarinen.

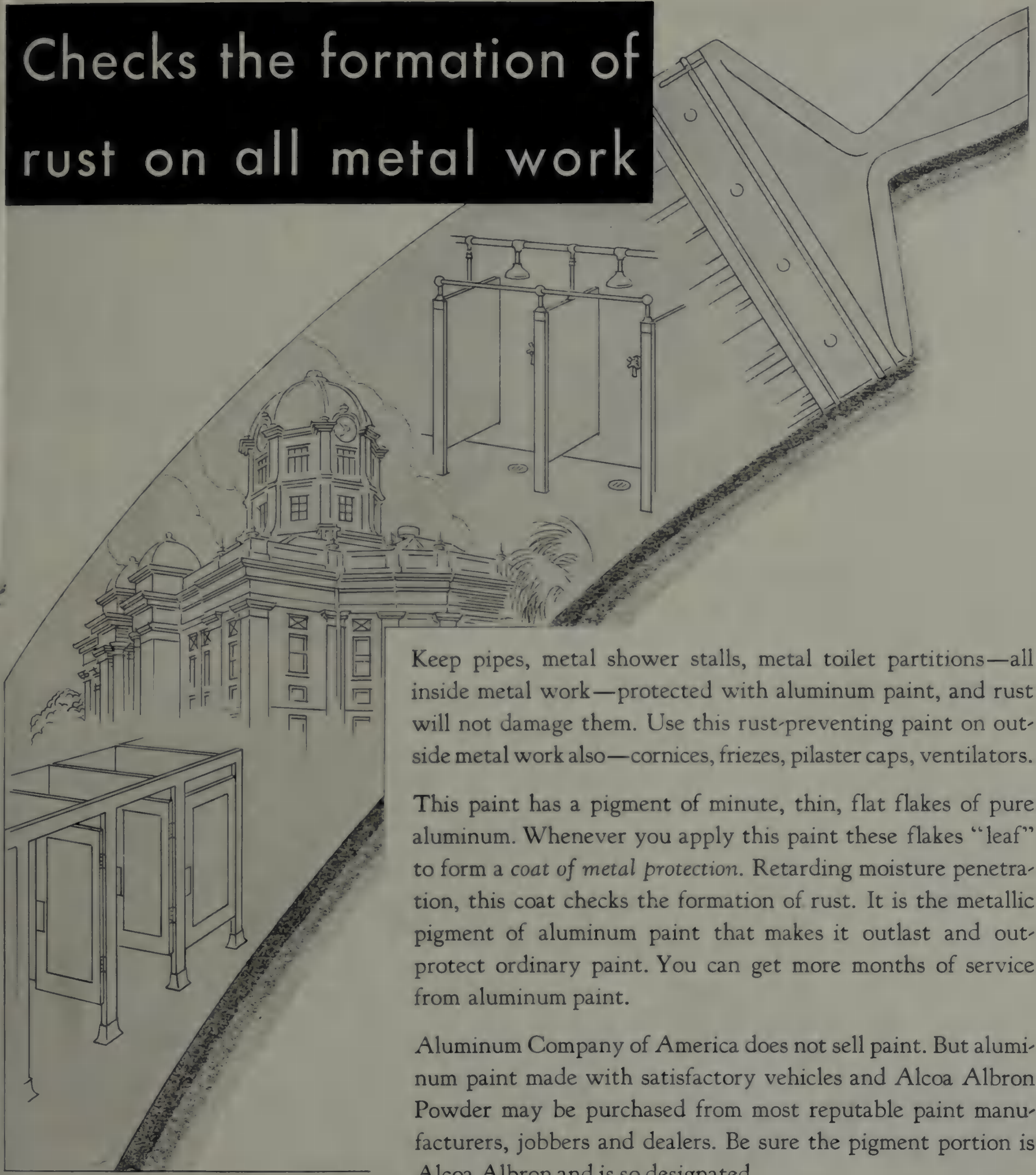
PORTFOLIO OF STORES

Shops and small stores present individual problems of design and construction to meet the specific purposes for which they are used. Each solution however may have ideas and innovations that can be utilized in similar structures. The portfolio has been selected with this in mind. It includes a chain food store by Ralph Bencker, a bookshop by J. R. Davidson, a confectionery shop by Jo Brandes, a branch clothing store by Dreher and Churchman, and a perfume shop by Thompson and Churchill, architects. Working drawings and details are also included.

TECHNICAL NEWS AND RESEARCH:
NEWSPAPERS AND PUBLISHING PLANTS

This study of an economically important and technically complicated building type lists the general requirements for personal comfort and mechanical efficiency in each phase of the process of turning manuscript copy into printed page form. Relationship to community in choice of location is noted. Likewise such technical problems as air conditioning, flooring, vibration-proofing and lighting.

Checks the formation of rust on all metal work



Keep pipes, metal shower stalls, metal toilet partitions—all inside metal work—protected with aluminum paint, and rust will not damage them. Use this rust-preventing paint on outside metal work also—cornices, friezes, pilaster caps, ventilators.

This paint has a pigment of minute, thin, flat flakes of pure aluminum. Whenever you apply this paint these flakes "leaf" to form a *coat of metal protection*. Retarding moisture penetration, this coat checks the formation of rust. It is the metallic pigment of aluminum paint that makes it outlast and outprotect ordinary paint. You can get more months of service from aluminum paint.

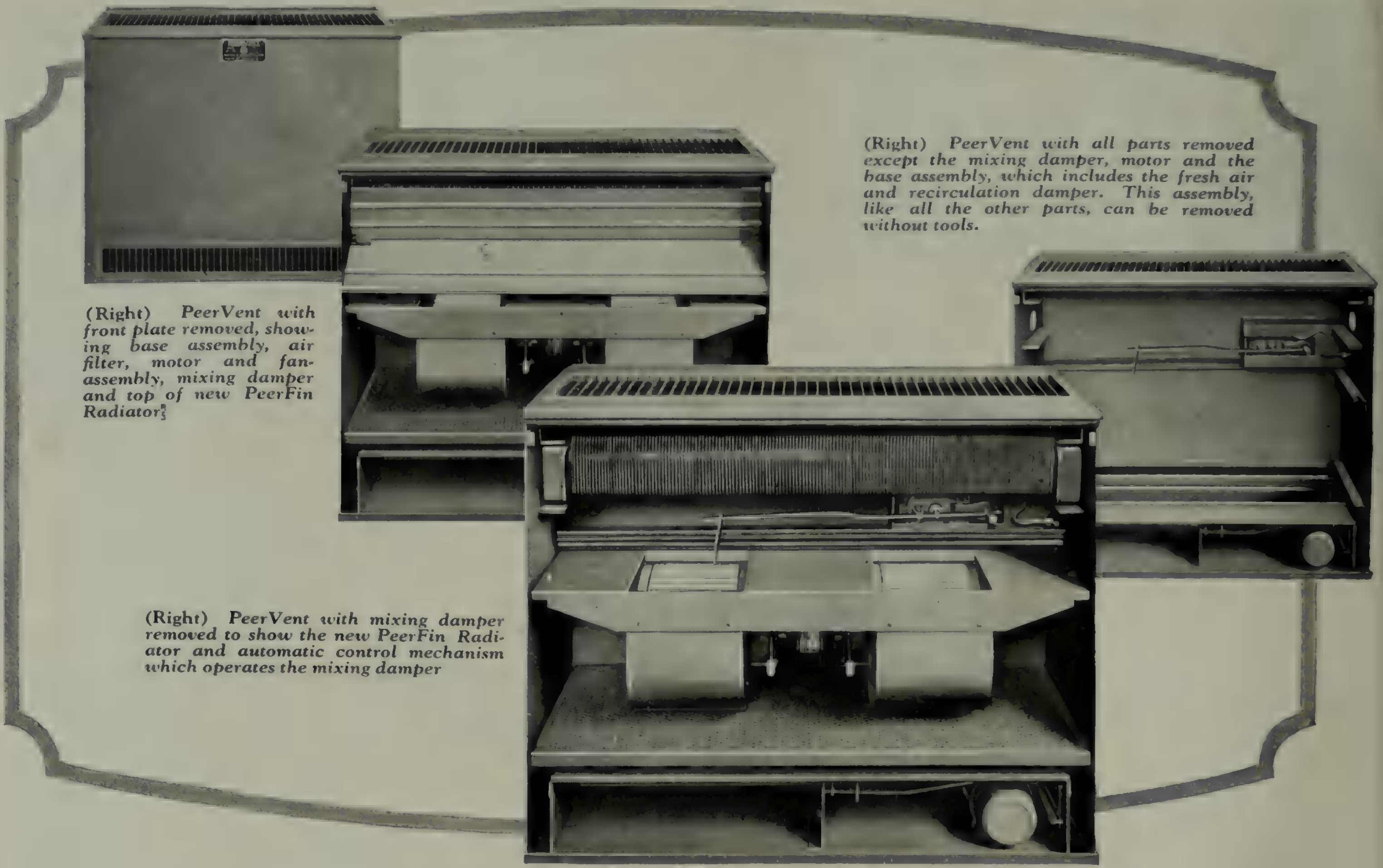
Aluminum Company of America does not sell paint. But aluminum paint made with satisfactory vehicles and Alcoa Albron Powder may be purchased from most reputable paint manufacturers, jobbers and dealers. Be sure the pigment portion is Alcoa Albron and is so designated.

Let us send you the booklet, "Aluminum Paint, the Coat of Metal Protection". ALUMINUM COMPANY *of* AMERICA; 2467 Oliver Building, PITTSBURGH, PENNSYLVANIA.

ALUMINUM PAINT—
THE COAT OF
METAL PROTECTION

ALCOA
ALUMINUM
ALBRON

ALCOA ALBRON
POWDER FOR
ALUMINUM PAINT



(Right) *PeerVent with all parts removed except the mixing damper, motor and the base assembly, which includes the fresh air and recirculation damper. This assembly, like all the other parts, can be removed without tools.*

(Right) *PeerVent with front plate removed, showing base assembly, air filter, motor and fan-assembly, mixing damper and top of new PeerFin Radiator.*

(Right) *PeerVent with mixing damper removed to show the new PeerFin Radiator and automatic control mechanism which operates the mixing damper*

Advantages of the Improved PeerVent Unit System of Heating and Ventilating

OUR CATALOGUE IS FILED IN SWEET'S

THE PeerVent Unit System permits independent service for each room with ample flexibility for changing weather conditions. Due to the exposure, window area and other factors, some rooms are harder to heat than others in the same building. It is here that independent heat control is provided by the use of PeerVents.

It is impossible to determine exactly the amount of heat necessary on any given day due to changes in direction and velocity of the wind. With PeerVents you have absolute control over these factors and the heat can be regulated by either the hand-operated or the thermostat-operated control on the PeerVent.

Only rooms in use need be operated. Therefore, all expense for ventilating unoccupied rooms is eliminated.

PeerVents offer thorough ventilation without drafts. The heated fresh air is so diffused upon entering the room that it is possible to stand or sit close to the PeerVent without discomfort.

PeerVents are absolutely quiet in operation. They are also easy to install in old buildings. Write for the Peerless illustrated catalog.

PEERVENT

PEERLESS UNIT VENTILATION CO., Inc.
BRIDGEPORT, CONNECTICUT
Pioneers in Unit Ventilation
Resident Engineers in Principal Cities from Coast to Coast

Making Buildings Rainproof

HOW MANY ARE?

How many are not! Enough of the latter to direct your closest attention to the increasing problem of wall leakage. Par-Lock appliers have the answer with . . . .

Dens-tect, a protective wall treatment in which asphalt is mixed at the nozzle with fine aggregate, building out to tangible thickness, filling every void and affording a continuous coating.

Par-Lock Plaster Key, proved by 15 years of successful use on surfaces plastered direct.

Spandrel Waterproofings to fit the requirements of the installation.

Gun applied asphalt coatings for every construction use.

The local Par-Lock Appliers can tell you of jobs close at hand rendered rainproof by their application. With a local, responsible contracting organization they bring you uniform, proved materials, uniform methods and unified, national Par-Lock policies. Rely on

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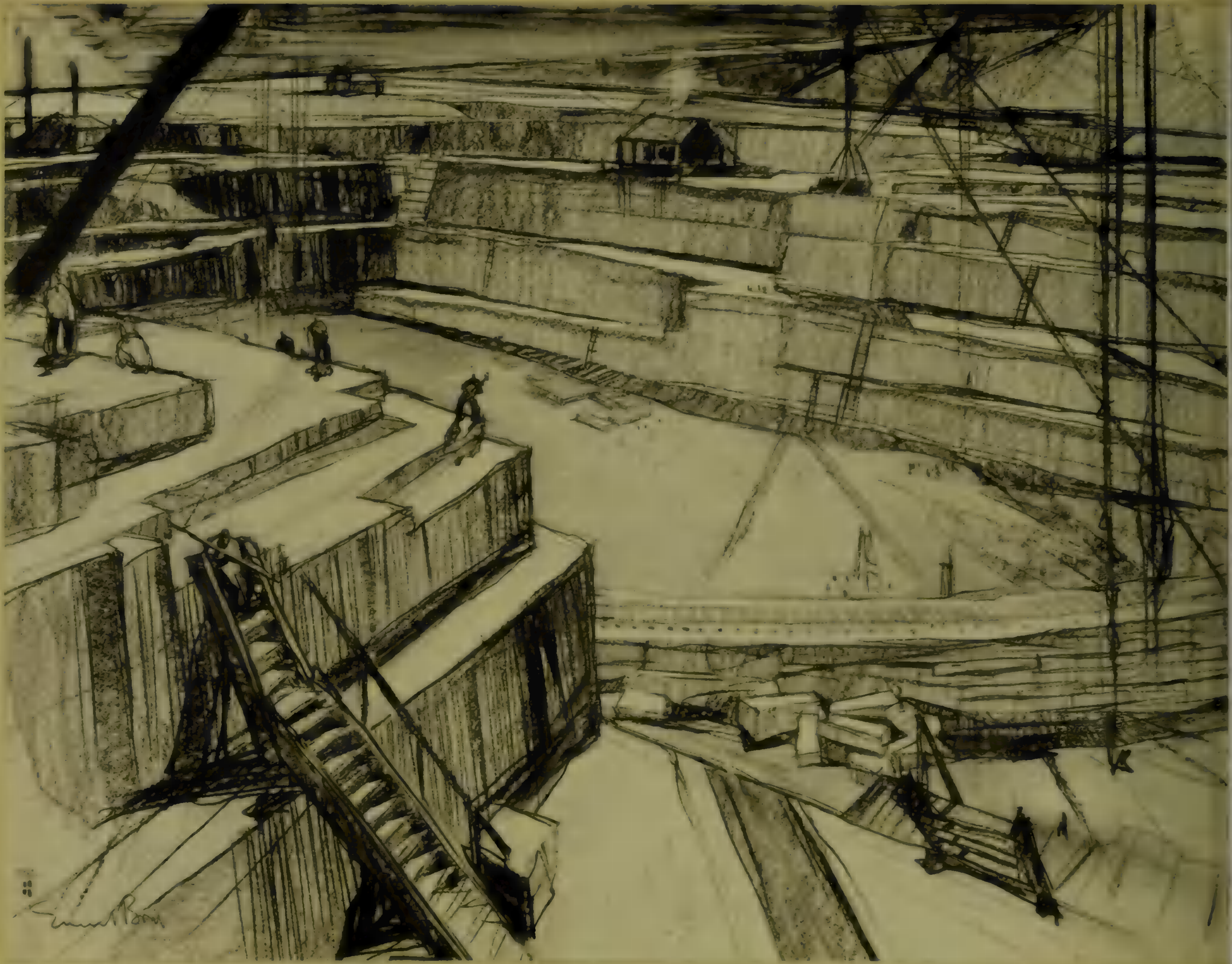


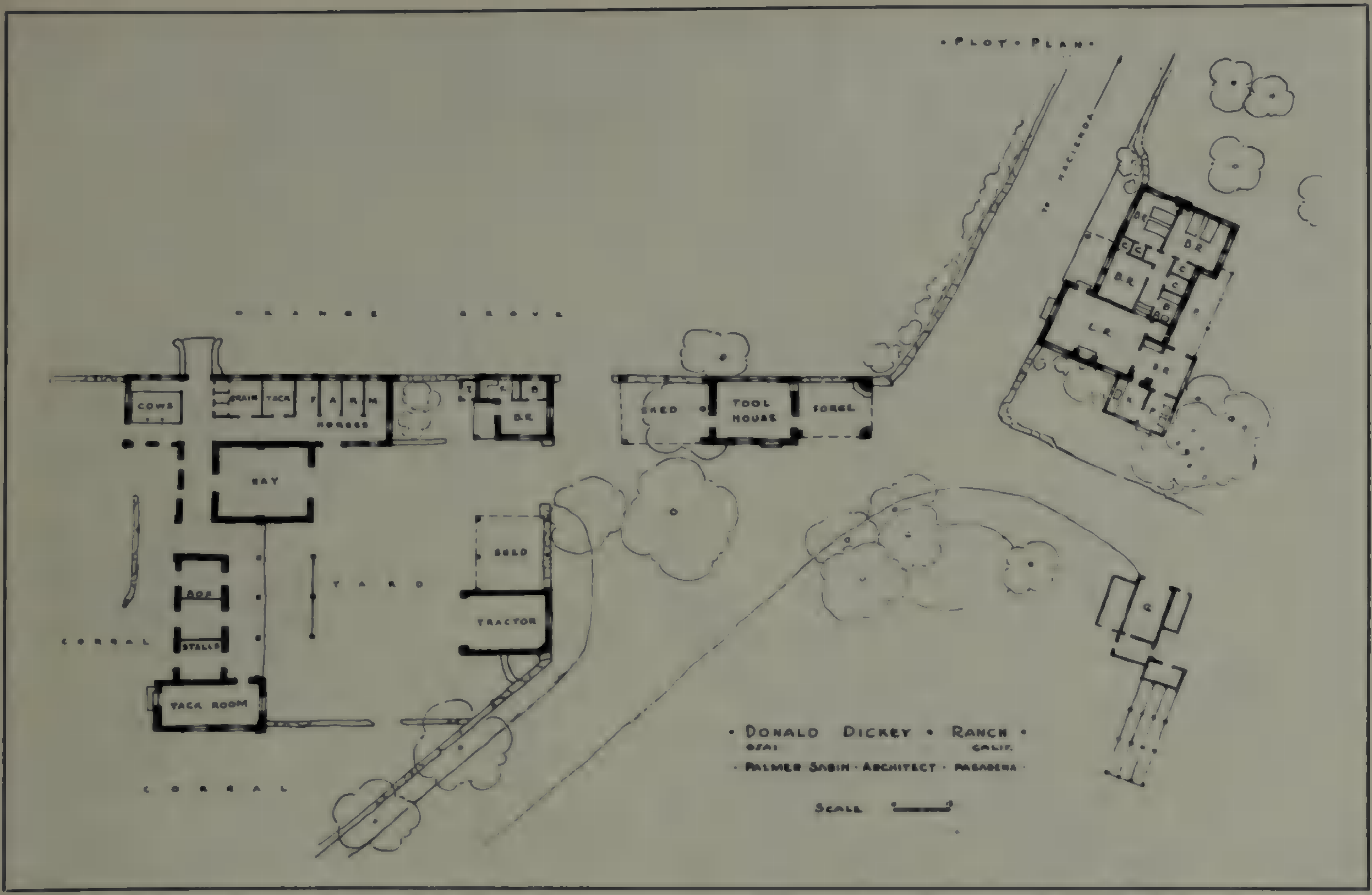
THE BIG HOLE

Number Two of a series of twelve drawings made at the Fletcher Quarries by Ernest Born.

GRANITE

H · E · FLETCHER CO.

WEST CHELMSFORD MASS.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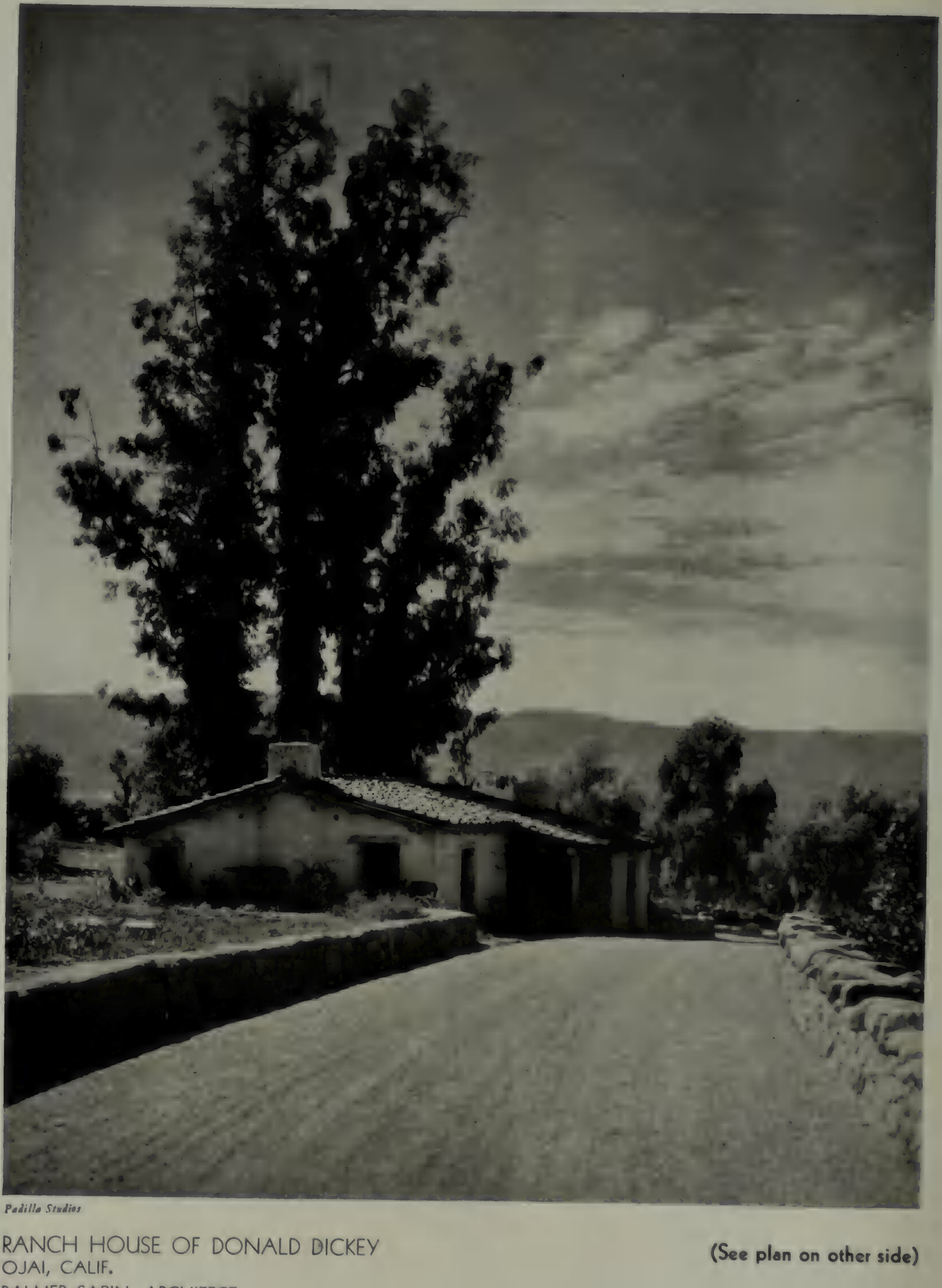

Padilla Studios

RANCH HOUSE OF DONALD DICKEY
OJAI, CALIF.
PALMER SABIN, ARCHITECT

(See plan on other side)

THE ARCHITECTURAL RECORD

AN ILLUSTRATED
MONTHLY MAGAZINE
OF ARCHITECTURE

VOLUME 68 NUMBER 5 NOVEMBER 1930

THE COUNTRY HOUSE

By HOWARD T. FISHER

ORIENTATION OF ROOMS

In most parts of America sunlight constitutes a precious commodity, especially during the winter, and the ideal room for most uses is one with east, south and west exposures thus enjoying sun throughout the entire day. This will, however, seldom be possible except with perhaps one or two rooms of the house, and the question therefore arises as to the best placing of the other rooms. In certain cases, of course, other considerations, such as view and trees, may be more important than sun in determining the disposition of rooms.

Living room. This room, as well as other rooms that may be extensively used during the day, such as the play room, should be given a southern exposure, and if possible both east and west exposures. Where both of the latter cannot be provided the western exposure is more important as it is probable that the rooms in question will be more apt to be occupied continuously in the afternoon than in the morning.

Dining room. A southeastern exposure is desirable for a dining room as this will give sun both for breakfast and lunch. An eastern exposure alone may be found satisfactory as the morning sun is especially attractive at breakfast. Western sun in a dining room has no particular merit as throughout most of the year the evening meal is eaten after dark.

Bedroom. An eastern exposure for a bedroom is objectionable to many people as the sun tends to wake them up. It has, however, the advantage that the occupants may enjoy the sun while dressing. A western exposure should not be provided for a children's bedroom or nursery as during the summer, especially with daylight saving, the light from the setting sun will keep the children awake long after they are put to bed. A purely northern exposure will be adequate for bedrooms not usually occupied during the daytime. Sleeping porches, however, should not ordinarily open to the north on account of the severity of the wind from that direction.

Bathroom. An east exposure providing sunlight in the morning while dressing is by far the most desirable for a bathroom.

Kitchen. Ordinarily occupied for many hours of the day the kitchen deserves a sunny exposure. Where the housewife does her own work she will be wise to place the importance of the location of the kitchen even above that of the living room. A purely western exposure should perhaps be avoided because of the heat in summer from the late afternoon sun.

Garage. The garage is the one room which can be advantageously located in the middle of the north side of the house as neither sun nor cross draft is of any importance.

Cross draft. In locations subject to hot weather the prevailing winds should be studied and adequate provision for cross draft made in all rooms, especially bedrooms. When bedrooms have windows on only one side the door should connect directly with a hallway through which the air may freely circulate. Louvred doors permitting the passage of air but providing privacy may be worthwhile, especially for guest rooms. To increase the flow of air during the summer, as well as to permit during the winter a more rapid cooling off of the bedroom on retiring, vent ducts, either gravity or fan-operated, may be provided near the ceiling on the wall opposite the windows.

SLEEPING PORCHES

Advantages. In summer the sleeping porch affords a cooler and airier place to sleep. By its use in winter the bedroom may be kept warm thus providing a comfortable room in which to dress in the morning. Perhaps even more important is the fact that in winter it is possible to go to sleep in a cool place instead of having to retire in a room still warm and which may take several hours to cool off.

Location. To assure an adequate cross draft sleeping porches should always be open on at least two sides. Wherever possible they should be located so as to connect directly to the rooms they serve. The ideal arrangement is for each room to have its own porch.

Construction. The porch may be either entirely open except for screens or else equipped with windows so as to be capable of being completely shut. In the latter case in order to get the maximum of air the windows should occupy all or nearly all of the outside wall area and if possible should open to the floor to permit the utmost cross draft in hot weather. Where the porch is left open additional beds will have to be provided inside for use in bad or very cold weather or in case of illness. However, where the porch is heated and capable of being completely closed this is unnecessary and the bedroom can be converted into a private dressing and sitting room.

DINING PORCHES

The dining porch should be directly accessible from the kitchen, or butler's pantry if one is provided, in such a way that a minimum amount of travel is required in serving. If the porch is equipped with windows so that it can be completely enclosed, the total number of days during which it can be used will be greatly increased. On the other hand this should not be carried too far as its porch character should definitely be preserved if it is to have any advantages over the dining room proper.

"PILLAR CONSTRUCTION"

Elimination of basement. Where economy is essential there has been for some time a growing tendency to omit the cellar as a standard feature of house design. With present methods of heating it is no longer necessary to locate the boiler or furnace at a level below that of the rooms to be heated. In smaller houses the laundry tubs can be located in the kitchen and in larger residences, where it may be desired to do the laundry in the house, a special room provided above ground with proper ventilation. The cellar, once required for the storage of coal, food supplies, trunks, window screens, etc., is no longer needed for this purpose. What storage space may be necessary can be better provided elsewhere.

While there may be some excuse for the present practice of remodelling existing cellars so as to provide additional living space instead of storage space no longer needed, there is certainly no real justification for designing a new building with living rooms below the ground level. Rooms intended for human occupancy should be placed where they can have large sunny windows, an attractive outlook and good ventilation. Even when entirely dry a cellar with small windows, no sun, no view and little air is no place for children to play or adults to sit.

Use of piers. With the elimination of the cellar, continuous bearing walls are no longer necessary for the support of the building and it will probably be found more economical to employ isolated piers. With the use of piers, however, the main body of the house can be easily located 9 or 10 feet above the ground.

Economy of cost. The cost of excavating and hauling away earth is reduced to only what may be involved in providing footings below frost for the supports. Beams carried on columns take the place of the continuous basement wall as a means of supporting the floor. Exposed to the outside air on its underside the floor must be insulated, but after insulation the total heat loss will be far less than that normally taking place through the floor and walls of an uninsulated basement.

Planning the ground area. By raising the main body of the house there can be preserved for use as a play or sitting place that ground area ordinarily lost, a fact of real importance where the house is located on a small lot.

The space under the house may be partly planted with grass and flowers, the rest treated as a terrace with flagging, or the entire area may be screened in to make a sitting porch.

Stairs may be either exposed or located in an enclosed stair-well set under the central portion of the house, the latter having the advantage that the approach will be fully sheltered by the building. This arrangement also permits access directly to an interior hallway above. An enclosed stair-well provides a means of concealing and protecting from frost the necessary supply pipes and sewage drains.

The automobile driveway may be carried under the house in such a way as to give the advantage of a porte-cochère. Where a garage is to be provided it should, of course, be located at the ground level under the house. If conditions permitted, doors might be placed at each end of the garage so that the car could be driven in one end and out the other without having to back out or turn around. Where no garage is provided the space under the house would furnish a convenient place to park a car out of the weather.

If desired the boiler or furnace can be located at the ground level in a small room built either in connection with a central stair-well or off the garage. It might be worthwhile to install a dumbwaiter directly accessible from the ground level and, if no incinerator is provided, a built-in refuse box into which waste material could be deposited from above.

Where the lot is small the house will have less tendency to cut up the property. There will be no front or rear portions of the building as all parts will be equally finished and equally open and accessible. By raising the living room one-story height above the ground level greater privacy will be procured.

ROOF PORCHES & TERRACES

Advantages of roof location. The roof usually provides a more open outlook and a better view than is possible at a lower level. Less cut off by trees, shrubbery or nearby houses, and open on all sides, it enjoys a cross draft no matter from what direction or how gently the wind may blow. As a result a roof porch or terrace will ordinarily be found far cooler in warm weather than one located at the ground level.

Because of the greater air movement and the height above the shrubbery there will also be less trouble from insects. Even where insects are unusually bad, sitting out of doors on a roof terrace without screens will probably be found possible if lights are not turned on. This constitutes a very considerable advantage in hot weather, as screens greatly reduce any existing air movement.

Raised above the level of the street the roof porch or terrace is more removed from the public view and so provides greater privacy. Also because the sun is less cut off by surrounding trees the roof affords an excellent place for sunbathing. Perhaps the greatest single advantage of porches located on the roof is that during the winter they do not cut the sun off from any of the rooms of the house.

Economy of area. Where sloping roofs are employed their entire area is unusable and so a total loss. In addition to the extravagance of this arrangement the loss of usable area may constitute an item of considerable importance, especially where land is at a premium and the house is located on a small lot. By the use of a flat roof, the ground area occupied by the house is, in a sense, not lost but merely raised to more advantageous position. Where a house is built on a steep slope the flat roof may give a level area not otherwise possible to provide. As a place for children to play, it may even have certain advantages over an equivalent amount of ground area, especially in spring when conditions may be too muddy for regular outdoor play. Constituting a sort of hurricane deck it provides an excellent place for such games as deck-tennis or ping-pong, and can be equipped with sand boxes, slides, etc. As a place to raise plants and flowers it may have advantages as well, the claim being made by Le Corbusier that they grow better in roof gardens than in the open ground on account of the heat furnished by the building.

L'Architecture Vivante

VILLE D'AVRAY FRANCE
LE CORBUSIER AND P. JEANNERET
ARCHITECTS

FLAT ROOFS

Advantages in design. The architect is unhampered by the necessity of providing an area of a size and shape capable of being covered with a sloping roof economical in construction. Freer use may be made of interior rooms, stairs or hallways, ordinarily to be avoided with sloping roofs because of the difficulty of providing with light or air. The total overall height of the building may, where desired, be kept much lower than is possible with a sloping roof.

Advantages in construction. That the flat roof, considered purely as a means of keeping out the weather, is easier or more economical to construct is clearly demonstrated by its almost universal use in commercial buildings. Where used for porch or terrace purposes it must be surfaced in some satisfactory manner to permit its being walked upon but otherwise the problem is essentially the same in residential as in commercial work. What snow may fall on the roof is, of course, permitted to stay there. It can do no harm and will only help to keep the house warm. If by chance it may interfere with the use of the roof as a play area, it can be easily shoveled off.

The flat roof permits the use of interior down spouts. Carried down inside the building where they cannot freeze, these will be found far more satisfactory than the sheet metal gutters and conductor pipes now in common use.

PLANNING THE ROOF AREA

The roof can be used for sitting, eating, sleeping or play purposes. It can be left as an open terrace, or can be covered, either with awnings or a permanent roof to produce a porch. The porch can be either screened or left open, although in most parts of America it will probably be advisable to provide screens during the summer months.

Dining porch. As a place to sit and as a place to play, whether on a screened porch or on an open terrace, the roof offers an ideal location. For dining purposes, however, the roof will probably not be found satisfactory unless a waitress is to be employed and a service pantry is provided together with a high-speed dumbwaiter connecting directly with the kitchen. It has been suggested by Le Corbusier that the kitchen and dining room be built at the roof level to prevent cooking odors from entering the rest of the house. If this were done meals could, of course, be served on a roof porch or terrace with the utmost ease.

Sleeping porch. For sleeping purposes the roof is ideal in every way with the one important exception that for greatest convenience a sleeping porch should connect directly with the bedroom or dressing room of a person who is to occupy it. Where this direct connection is not possible for any reason the roof will be found an excellent location. If convenient the sleeping porch should be located adjacent to an open terrace so that when desired, and the weather and mosquitos permit, the beds can easily be moved out under the open sky.

Sunbathing. As it seems not unlikely that the vogue for sunbathing may increase rather than diminish in the future, provision should be made for this purpose. In warm weather the open roof terrace may be used conveniently where it can be cut off from the rest of the house and is not visible from other houses. To accomplish the latter result and to shut off any wind a curtain which can be pulled around the terrace is frequently used in European houses. In many cases it will be worthwhile to provide a special small room with a cot. This should be equipped with a window of sufficient size and so placed that the direct rays of the sun can enter and fall on the cot during the five or six hours in the middle of the day. The window can be glazed with an ultra-violet glass but this is not necessary as by providing heat it will probably be found possible to keep the window open at all times when the room is in use. The window should be so arranged that persons cannot see in, thus permitting the user to dispense with all clothing.

A more ambitious scheme for providing sun baths calls for a complete glass room to be built on the roof of standard conservatory construction and glazed with ultra-violet glass. Such an arrangement would be of special value as a children's playroom. Even where the owner is interested in having a conservatory for plants rather than for sun baths the roof offers many advantages as a location.

WATERPROOFING

Canvas. For week-end houses or small inexpensive residences a roof of canvas may be found satisfactory if kept well painted. In addition to being economical the material itself constitutes a suitable finished surface upon which to walk. Leaks can be easily repaired in the same manner as with a canoe.

Built-up asphalt roofing is used almost exclusively for flat decks at the present time, and if properly laid will be absolutely watertight and possess great durability. This type of roofing, however, must be covered with some kind of surfacing material as it presents an unattractive appearance and will not withstand much wear.

Auxiliary equipment. To permit the full enjoyment of roof porches or terraces a telephone outlet should be provided at the roof level. Also desirable, especially in connection with a roof sleeping porch, is a small lavatory containing a watercloset. An outdoor fireplace may prove a real pleasure on cool evenings in the fall or spring and will be especially attractive to children for the purpose of cooking picnic suppers. A dumbwaiter running from the basement to the roof might be worthwhile for supplying wood as well as for carrying refreshments. Where the same dumbwaiter is to be used for carrying both heavy and light loads it should be either electrically operated or of the two-speed variety.

Stairs. Access to the roof may be gained either by an interior or an exterior stairway. The latter may be cheaper to construct as no pent house will be required. The exterior stairway may start at the ground level, but where the building is two stories or higher exclusive of the roof this is not necessary, and may at times be objectionable in that the roof will have less feeling of privacy if directly accessible from the ground. Where exterior stairs do not connect with the ground access can be gained to them either directly from a door or indirectly from a second-floor porch or terrace.

An interior stairway, while requiring the construction of a pent house, offers several advantages. The connection between the interior of the house and the roof will be more intimate and the openness will be increased. If equipped with adequate doors and windows the pent house may serve as a source of light for the illumination of an interior hall or stairway, as well as acting as a giant ventilator for the entire house. To prevent excessive heat loss from these windows or doors during the winter they should be double-glazed. A sunny nook with overhanging roof, giving protection from the wind and rain, can be built in one side of the pent house and telephone, lavatory and sunbathing facilities may also be provided. Where economy is essential an interior stairway can be used with a hatch instead of a pent house. This should be of adequate size, and for ease in opening and closing should be counter-balanced.

Where membrane roofing is used gutters should be avoided if possible and the entire roof surface sloped evenly towards the drains. Where the roof is supported on wooden joists or where there may be possibility of unequal settlement a pitch of not less than one quarter inch to the foot should be provided.

Special care should be taken where the roof meets the parapet wall.

Where the parapet wall is of concrete, sheet metal counter-flashing should be imbedded permanently in the concrete at the time it is poured. The top of this counter-flashing should be high enough above the finished roof surface to prevent all possibility of melting snow seeping in above it. The membrane should be turned up at the wall and the base-flashing carried up to the point where the counter-flashing enters the wall. By carrying the metal counter-flashing all the way down over the base-flashing the latter is protected from mechanical injury.

Special care should be taken around chimneys. If an outside fireplace is provided the membrane should be run under the entire hearth and turned up at the back and at each side. The fire-brick lining can then be built in afterwards on top of this membrane. To prevent the heat of the fire from softening the membrane a sufficient thickness of brick should be provided. A fireplace of the Franklin stove variety might be provided in place of one built in the chimney. This could rest on a hearth placed over the membrane roof, and in addition to giving more heat would present no waterproofing difficulties.

Monolithic concrete. In a building of reinforced concrete construction it may be possible to make the structural roof itself watertight, thus eliminating the necessity of providing not only a separate roofing material but all flashing and counter-flashing as well. This result can be accomplished either by an integral waterproofing or by a waterproofing applied to the top surface of the concrete. In either case a sufficient amount of reinforcing should be used to prevent as far as possible the formation of cracks resulting either from unequal settlement or from temperature changes.

Welded metal. One of the major advantages of metal construction as applied to houses would be the ease with which an absolutely permanent watertight roof could be produced by merely welding the joints. The welded steel battledeck floor already in commercial use would constitute an almost perfect solution of the problem if used in connection with steel parapet walls or open metal railings. In addition to its permanence and economy of original cost no separate waterproofing or flashing would be required.

Scuppers. To take care of the possibility of the drains becoming clogged scuppers should be provided a few inches above the roof level.

Cahiers d'Art

VILLA AT NEUILLY, FRANCE
GABRIEL GUEVREKIAN, ARCHITECT

SURFACING THE ROOF

Elements to be considered. Where the roof is to be used for porch or terrace purposes its surface should be finished in such a way as to withstand footwear and be attractive in appearance. If it is to be used as a place for children to play the surface should also be resilient and of a type which will not absorb too much heat in the sun. It should be as permanent as possible, requiring a minimum of upkeep.

Canvas. If canvas is used as the roofing material no further surfacing is required other than paint.

Concrete. Where the construction is of reinforced concrete with integral waterproofing it is not necessary to provide any other surfacing material unless a more attractive appearance or a more resilient surface is desired. Where the waterproofing instead of being integral is applied to the surface it will probably be necessary to cover it in some way, at least with a layer of cement, in order to prevent damage from wear or mechanical injury.

Wooden slats. An inexpensive means of protecting a membrane roof and one which at the same time gives a surface suitable to walk upon is to construct a light flooring of wooden slats setting them a little apart so as to leave spaces through which the water can run. The flooring can be set level, the membrane having a sufficient pitch to assure proper drainage.

Earth with grass or flagging. Probably the simplest and cheapest method is merely to fill in a layer of earth, planting it with grass and flowers and paving it with flagging of some sort where desired. The thickness of fill required will depend on such considerations as the prevailing climate, the type of plants to be grown, etc. In addition to its economy this method has several distinct advantages. As the earth will have a certain insulating value, especially when it comes to keeping the house cool in summer, it will be possible to get along with less insulation or even to eliminate it entirely as far as the roof is concerned. As the earth will remain damp and cool most of the time either from rain or from artificial sprinkling the life of the membrane roofing should be greatly lengthened. With the entire structural roof protected from extreme heat and cold there should be less trouble from expansion and contraction and as a result, where concrete is used, less danger of temperature cracks. If a leak should ever develop the removal of the earth where necessary would be an easy matter and one not involving skilled labor.

Flagging can be of stone or of some other material such as brick or tile. If stone is employed it can be either of the thick type such as is usually used for garden walks or of thin sheets of slate or soapstone, the latter having the advantage of lightness. Concrete slabs can be used for this purpose. To reduce the weight an aerated concrete or one made with light aggregates might be used.

Where flagging is used and it is not desired to grow grass or plants a thin fill of sand could be substituted for the earth. This would be found cleaner and less apt to spatter during rain. Whether it will be worthwhile to grow plants or flowers will probably depend largely upon the climate and the interests of the individual owner. Certainly flower beds should not be made an integral part of the architectural design unless the climate is such as to permit their being filled at least during a majority of the year.

An objection to the use of earth is that the roof will be damp after rains and so will not provide a dry place to sit. Also because grass, except in a very mild climate, will not present a satisfactory surface in winter and spring, the flagging should be set with fairly narrow joints. Under porches, especially if screened, it will not be advisable to attempt to grow grass or plants, a fill of sand probably being preferable to one of earth.

Gravel. Another solution employed frequently in Europe is merely to provide a thin layer of gravel. This can be of the round roofing variety, but a material, such as driveway screenings, which will interlock and compact solidly will be found more satisfactory.

Where a layer of porous material such as earth, sand or gravel is used there is probably no necessity for pitching the structural roof to the drains. The only objection to the dead level roof is that where not covered by such a material the slightest irregularity or unequal settlement may produce puddles in the low spots.

Tile. In many cases, especially for a covered or screened porch or where the winters constitute a considerable part of the year, the solution discussed above may not be entirely satisfactory or it may be desired to use a more finished material such as tile. Promenade tile, or slate in thin sheets, is frequently set on top of a membrane roof in hot mastic with mastic joints. This, however, will be found unsatisfactory, as during warm weather the mastic in the joints will become soft and will be tracked all over the roof and into the house. Where the tile is to be set in mastic the joints should be left open and filled later with Portland cement mortar. Every precaution should, however, be made to procure a solid bed of mastic under each tile as otherwise water may fill the voids, freeze and cause the tile to heave.

The tile could be set in a thick bed of mortar in the manner usual for interior work, but this is to be discouraged, especially in connection with a membrane roof, because of the great difficulty of making repairs in case a leak should occur. It is also claimed that tile set by this method is very subject to injury by frost. Wherever tile is set with solid joints, unless the area is relatively small, provision must be made for expansion as otherwise there is danger that the parapet walls may be pushed out or the tile heave. Material used in expansion joints should be such as will not easily be tracked about during hot weather.

Resilient flooring. Tile, while satisfactory in most respects, has the serious disadvantage where roof is to be used for play purposes that it is entirely unresilient. Most of the more resilient flooring materials available are unsuitable for exterior use. Ordinary interlocking rubber tile has however been used for this purpose and there is now available a special rubber tile* made for paving exterior sidewalks which is unusually resilient. Certain types of mastic floors might possibly be used. Zenitherm,** while less resilient, is, according to its manufacturers, able to withstand outside weather conditions. Although not resilient as compared with the above types of flooring, blocks of end-grain wood might be used if adequate provision could be made for expansion.

INSULATION

Type and installation. Where the construction is of reinforced concrete, cork board or some such, insulation can be applied to the under side of the concrete slab. If a filling of earth or sand is to be used over a membrane roof it might be possible to apply the insulation on top of the concrete, although in this position it will be found less effective than if placed on the inside. Where the roof rests on wooden joists the space between the joists can be filled with some form of loose insulation. Rockwool, though possibly subject to criticism when used in a vertical wall on account of the danger of settlement, may constitute a satisfactory and economical solution of the problem. Used on a flat surface any settlement which may occur will do no harm other than to reduce slightly the total insulating value.

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* Manufactured by the Wright Rubber Products Company, Racine, Wisconsin.

** Manufactured by Zenitherm Co., Inc., Newark, New Jersey.

Amount of insulation. The real problem, however, is to decide not the type of insulation to use but the amount necessary to guarantee against overheating. There is at present an unfortunate lack of data on this phase of the subject, especially as applied to dwelling houses, which makes it extremely difficult to give any specific recommendations. Manufacturers of insulation all promise to keep your house cool on the hottest days by the application of their products, but it is difficult to take their recommendations seriously as the thickness of material specified to produce the desired result is frequently as little as ½ inch. The situation will, of course, be somewhat affected by the color of the roof surface, since the darker that color the more heat is absorbed. Consideration should also be given the heat conductivity of the individual insulating material used as there is considerable difference between the best and poorest of the materials now on the market. Where a filling of earth or sand is used on the roof the amount of insulation required would probably be very greatly reduced.

Upper roof. In addition to insulating the roof proper it is probably equally desirable to insulate the upper roof over any covered porches, as otherwise under a strong sun and with no breeze they may become objectionably hot. Four inches or less of rockwool could be used for this purpose with completely satisfactory results.

Conductor heads. For a foot or so around conductor heads, as well as under gutters if there are any, it is advisable to omit all insulation. In the winter time this will permit the heat from the house to escape and melt any snow or ice at these points which otherwise might interfere with the rapid run off of water.

PARAPETS AND RAILINGS

Where a railing is used it should be of a type which a child cannot climb. The railing or parapet should be high enough to prevent all possibility of any one ever falling over it, and high enough to discourage any person from carelessly sitting on it. At the same time it should not be any higher than necessary, especially if solid, as otherwise it will cut off the view of persons sitting on the roof. The proper height is probably in the neighborhood of 35 to 37 inches.

SOIL STACKS

One of the problems created by the use of the flat roof is how to handle soil stack vent pipes so as to be unobjectionable. Where it is at all possible to do so the best arrangement is to carry these vents up through the pent house and terminate them just above the pent house roof. If for any reason this cannot be accomplished vents can be carried up in a chimney, the pipes being built in at the time of construction. Where neither of the above solutions is possible, it will be necessary either to leave the pipe exposed, merely carrying it up six or seven feet.

WINDOWS

General considerations. With increase in size windows frequently become more difficult to operate, yet the difficulty of operating a few large windows is preferable to the inconvenience of opening and closing many small separate units. A few larger units give better light and tend less to cut up the wall spaces. Corner windows, giving a wider outlook and a more open effect, will be found attractive.

In general if windows are to open at all they should open as completely as possible. This is especially true of windows for bedrooms where natural ventilation is seldom adequate on hot nights. Where windows become very large and tend to fill the entire outside wall area 100% ventilation is no longer necessary or desirable.

Double-hung. While having the advantage of watertightness and ease of operation the double-hung window furnishes only 50% ventilation. Attempts have been made to cure this by providing pockets in the wall into which the sash can be lowered. The most unfortunate feature of this style of window is the cross bar, which interferes with vision glass. To provide unobstructed vision double-hung windows should be set at a height which will bring the bottoms of the cross bars not less than 6′ above the finished floor.

Casement. Although providing full ventilation the in-opening casement is hard to make watertight against a driving rain and is objectionable in that when the window is open the valves project into the room and interfere with the curtains.

Also providing full ventilation, but not subject to the above faults, the out-opening casement creates a difficult problem of screening. One of the advantages of this type of casement especially if built flush with the outside surface of the building is that the valves can be set to catch a breeze from any direction. The location of the window flush with the outside also gives more space to the interior and by providing a wider sill and more sun furnishes an excellent place to grow house plants. An objection to this type of window is the inconvenience in closing, especially during rain when it is necessary for one's arm to get wet in order to reach the handle of the projecting valve. The latter objection can be eliminated and the closing operation simplified by the use of patented operating devices. Where windows of this type are used care should be taken to see that tight non-removable pins are provided in the hinges, as where bolts and nuts are used the window can be easily opened from the outside by merely using a wrench. Many manufacturers now furnish windows with fixed lights above the movable valves, or at the side. These, no longer supplying full ventilation, lack one of the principal advantages of casement windows.

Sliding. Employed extensively in Europe the horizontal sliding sash, while not providing full ventilation, is especially well adapted for use in long banks of windows.

There are a number of patented sash devices on the market especially suitable for long banks of windows. Screened on the inside these fold out and slide to each end of the window so as to give 100% ventilation.

French casements. Windows opening to the floor provide more complete and rapid ventilation than those with normal sill heights. This is especially valuable in a bedroom as it permits a more rapid cooling of the room upon going to bed. Where a large number of French windows are used in a living room it may be possible to open the room sufficiently to avoid any necessity for providing a sitting porch. The use of French windows will, however, give a far different psychological effect, a room equipped with them being more open and less private. Whether this will be desirable or not will depend largely upon the type of location in which the house is built. Used in connection with a house on a small suburban lot near the street they will probably be less attractive than with a house in the middle of large grounds in the country. Where French doors open out on to a terrace or balcony raised a story or more above the ground level, complete privacy and openness may be procured.

Windows opening to the floor, in addition to being of the casement type, may be of the sliding or sliding-folding variety. With the former it may be possible to slide the sash horizontally into pockets in the wall thus providing 100% ventilation. The latter is particularly adaptable to large window spaces. Where used between a room and a screened porch, the French windows themselves need not be screened and a simpler and more attractive result will be procured.

SPECIAL WINDOW INSTALLATIONS

Windows for growing plants. Where an owner may have a particular interest in growing house plants a special window should be provided for this purpose. This should face directly south if possible, but otherwise easterly rather than westerly, as the morning sun is preferable to the late afternoon sun. To furnish the greatest amount of sun the glass should be set flush with the outside wall or, better, project beyond the wall in the form of a bay. Overhead light is of great importance and where a bay is used glass may be provided not only at the sides, but also at the top. The glass may be double to prevent injury to the plants from cold. Heat and ventilation should be provided in such a way as to avoid scorching the plants or injuring them from cold drafts. This can probably best be accomplished by providing radiators and a small louvred opening through the wall under the plant bench and leaving a narrow space between the plant bench and the wall for the warmed fresh air to rise. An outlet should be provided at the upper part of the window for the air to escape. The bench itself should be arranged with drains so that the plants may be freely watered. Glass shelves may be fastened against the window for smaller plants.

Where it is desired to engage in more extensive indoor gardening than is possible with the above a small conservatory should be provided, together with a greenhouse in which to raise the plants for the conservatory. While these constitute separate units they should if possible have direct access from one to the other.

Bedroom windows. To eliminate the bother of having to get up to shut bedroom windows whenever it begins to rain and to provide ventilation during the rain some arrangement is desirable to permit windows to be left open without letting in the rain. Wide projecting eaves will, of course, accomplish this result, but where these are not provided it may be possible to construct a small hood over each window. If these should cut off some of the midsummer sun it would not be objectionable as long as they did not project far enough to keep out the sun in winter. Windows looking on to porches can always be left open during a storm and are especially desirable in a bedroom for this reason.

Certain of the standard casement windows contain sections above the main valves which are hinged at the top and open out. These may be used to provide ventilation during rain.

Ultra-violet glass. While the best glasses on the market for the purpose of transmitting the ultra-violet rays of sunlight may be worthwhile for the treatment of invalids in hospital solariums, the value of their *extended* use in residence windows is doubtful. A solarium glazed with special window glass or windows exposed to the direct sunlight are necessary in order to obtain beneficial results in preventing rickets and presumably for general therapeutic purposes. As a result, wherever it is possible, it is better to utilize the direct sunlight by the use of an open solarium or by getting out of doors with as few clothes on as possible. A few minutes in direct sunlight at noon may be worth more than hours sitting indoors behind a window. For a complete discussion of this subject and for data on the different glasses now on the market see Bureau of Standards' Research Paper No. 113, entitled "Data on Ultra-Violet Solar Radiation and the Solarization of Window Materials".

Double-glazing. See discussion under "Humidification". Double-glazing will be especially desirable back of window seats as a means of preventing drafts and reducing the cold from the window.

Shutters. Where it is anticipated that a house will be left unoccupied at frequent intervals, built-in steel rolling shutters may be installed over all windows to discourage burglary. Windows of the detention type originally developed for hospitals might be used where there is fear of burglary.

FIXED WINDOWS

Since the science of ventilation was first developed there has been talk of the possibility of employing fixed windows, sealed permanently in place at the time the building was erected and never to be opened. While such an arrangement would preclude, to quote from Lewis Mumford, "any human pleasure that may come from the gesture of throwing wide the window and taking in a breath of purer or cooler air" the idea as applied to house design is not without very considerable merit. In order to get his "breath of purer or cooler air" the occupant will have to step out on to the porch or terrace or turn on the ventilating system. The pleasure of "throwing wide the window", if that operation in itself may be described as a pleasure, he will have to forego, but in its place he will receive more significant if less sentimental benefits. Windows will be preserved not to be opened but to be looked through and to provide light during the day.

Economy. The saving in initial cost through the substitution of fixed sheets of glass for movable windows would be very considerable. In place of sash, frame, glass, pulleys, sash cords, window weights, hinges, handles, locks, screens, screen hardware, weather-stripping, etc., there would be simply a plain piece of glass and a light frame of the type used in store front work. The labor involved in setting single sheets of glass in permanent frames would be very much less than that of fitting and adjusting each one of the movable windows in a residence and of applying the hardware. The advantages of double-glazing could be provided more effectively at far less cost and with less inconvenience than would be possible with movable windows. With fixed windows sealed tightly in place there would be a minimum of air leakage with a resulting economy of fuel.

Better air conditions. Where the outside atmosphere may contain soot, dirt or dust or when the weather is hot the "purer and cooler air" will be gained not by throwing wide the window but by leaving it

HOUSE AT VILLE D'AVRAY
LE CORBUSIER AND P. JEANNERET
ARCHITECTS

tightly shut. By proper filtering, all dirt together with hay-fever-producing pollen may be excluded from the house with an increase in comfort and a decrease in cleaning, redecorating and even personal laundry bills. With tightly sealed windows and double-glazing, cooling in summer will be found economically possible and through the reduction of air infiltration a higher and more uniform humidity could be maintained in winter without the nuisance of condensation.

For sleeping purposes either a regular outdoor sleeping porch could be used or else an artificially ventilated bedroom. The latter, in addition to having the advantages mentioned above, would enjoy a uniform controlled night temperature and a positive air movement on warm nights when otherwise, with natural ventilation through open screened windows, there might not be a breath of air stirring. One of the greatest merits of this arrangement would be the complete exclusion of all outside noises. In fact for a residence in a noisy location, such as in the city, near railroad tracks or on an automobile highway, this might constitute its greatest single advantage.

In case of possible mechanical failure of the ventilating system the doors on to porches, etc., would provide sufficient air.

Other advantages. Curved glass could also be used more extensively. The view will be unobstructed by screens or by the necessity of providing frequent dividing bars. Screens will not have to be stored or taken down and put up every year. It will not be necessary to run and shut windows whenever it begins to rain and there will be no damage from water or snow to interior furnishings through carelessness in leaving windows open. Burglary will be discouraged as the windows will not be left open and cannot be jimmied.

INSECT SCREENS

Outside. Screens can be placed on the outside with those types of windows that do not project when open. Outside screens constitute the least inconvenience as having once been put up in the spring they do not have to be touched until they are taken down in the fall. Although with double-hung windows full length screens are not necessary, their use permits the window to be opened at both the top and bottom thus providing better ventilation.

Inside. Where the screens must be placed on the inside they should open and close easily to permit the operation of the window, although where operating devices are installed this is, of course, unnecessary. Inside screens are of three types: hinged, sliding (vertically or horizontally), and roll-up. Screens of the roll-up variety while not always operating with the utmost ease have the advantages that they do not have to be taken down and put up yearly and that wherever a window is closed the screen can be rolled up out of the way where it does not have to be looked through. Hinged and sliding screens have the advantage that when they are taken down in the fall inner storm windows can be putup in theirplace.

Manufacturers of casement windows realizing the disadvantage under which their product is laboring have recently undertaken to solve the screen problem and some very interesting results have been produced. It is now possible to buy from the same manufacturer both the window itself and the screen design to go with it.

HEATING AND AIR CONDITIONING

Probably the most difficult technical problem with which the architect is faced in residential work is how to produce the best year-round "weather" within his houses.

CENTRALIZED DUCT SYSTEM: WARM-AIR FURNACE

After a period of disrepute the "hot air" heating system of a generation ago is now returning to favor under a significant change in name. With the air circulated at a lower temperature and in greater volume, with more adequate cold air returns, with better designed duct work and the assistance of electric fans to warm more distant or exposed parts of the house and with proper arrangements for humidification, its old faults have been removed or even converted into virtues.

Advantages. These are many. In addition to the fact that the air while circulating through the system can easily be humidified to any desired point, it can also be filtered, ozonized if desired, and cooled and de-humidified in summer. No radiators are needed. As the system contains no water it cannot freeze and does not need to be drained whenever the house is left in cold weather, an especial advantage in a week-end house or a house frequently left empty during the winter. Also of advantage, particularly in a week-end house, is the fact that heat will be delivered to the rooms within a few minutes after the furnace is fired. The absence of drag when a register is turned off as well as when it is turned on

Padilla Studios

WEEK-END HOUSE OF JOHN BURNHAM
PALM SPRINGS, CALIF.
PALMER H. SABIN, ARCHITECT

is of especial advantage in a bedroom as it permits the room to be cooled quickly on retiring and warmed quickly on arising. The warm-air system also produces a more healthful air motion and the air is circulated through the entire house instead of being continually recirculating within a given room where it may become stale.

Disadvantages. One objection to the system at present is that where an oil burner or fan is used the ducts act as speaking tubes to carry the noise throughout the house. This objection can, however, be largely eliminated by the proper installation of a quiet type of burner or fan and by offsetting the ducts and lining them for a short distance with hair felt. Another objection frequently raised is the danger, especially where oil burners are used, that the combustion gases may leak through the joints of the furnace and thus be introduced directly into the house. On this account it is advisable to choose a furnace with as few joints as possible and to inspect the joints yearly after installation.

Gravity system. The air in a warm-air system is circulated either by gravity or by a fan, or by a combination of the two. Where a house is small and compact and the furnace can be located in the center of the basement, thus permitting short runs, the gravity method may be found entirely satisfactory. Some valuable research into the working of this type of system has recently been done by the University of Illinois, in cooperation with the National Warm-Air Heating and Ventilating Association, at its Research Residence in Urbana. The results of these experiments are available in the form of bulletins.

Combination system. Where for any reason the natural flow of air by gravity is insufficient to heat all of the house adequately the system may be supplemented by the installation of a booster fan. This can be operated by a switch or, where automatic heat is used, it can be wired in series with the burner. By-pass shutters are provided which open and close automatically so that the air placed in motion by the fan can continue to circulate by gravity. These shutters can be operated by direct mechanical means or by the air pressure produced when the fan starts. In either case quietness of operation is essential. If filters are used the shutters should be so arranged as to by-pass the air around them except when the fan is running.

Forced-air system. It is now customary to ignore gravity flow entirely where automatic heat is to be employed and to design the system for forced-air circulation. This has several advantages. Heat is produced throughout the house more uniformly, more positively and more quickly. Ducts may be smaller and greater freedom permitted in their location. It is even possible with a forced warm-air system to locate the furnace on the first floor, thus eliminating the necessity for a basement. Where open metal joist construction is used the space between the ceiling of the first story and the floor of the second story could be used as a duct to carry the warm air to all the rooms.

Where a fan is employed a slight cooling effect due to the movement of the air can be produced by its operation during hot summer weather, but without the addition of water sprays or mechanical refrigeration no great benefit should be anticipated from this source.

Outside vs. recirculated air. Much argument has been devoted to the relative merits of recirculating the air within the house or of introducing outside air. At the present time with houses built so loosely as to permit a constant and steady air change even with all the windows shut, there is probably no real advantage in the introduction of any outside air, and to introduce more than a small percentage will be found highly extravagant of fuel. In the future, however, with the construction of air-tight walls and closer fitting windows the introduction of fresh air will probably be a necessity, and the ease of its introduction with this system will probably constitute one of its greatest merits.

Cold-air returns. Where recirculation is used adequate cold-air return ducts are of the first importance. In a very small house one large centrally located return may be adequate, but it is usually desirable, especially in large houses, to provide a separate return from each of the principal rooms. Every room the door of which may be periodically kept closed should have a separate return. Where returns are provided in bedrooms the cold-air register faces should be equipped with shutters in the same manner as the hot-air faces so that they may be closed at night when the windows are open in order to prevent the cold air from being drawn into the system and cooling off the house. No returns should ever be installed in such rooms as the kitchen or garage as it is undesirable to circulate their odors through the house. In the case of a garage there may be the further danger of drawing gasoline fumes into the system with a possible resulting explosion. In order to provide an adequate flow of warm air to such rooms they should be vented outdoors, either by a sheet metal duct or by a chimney flue installed for that purpose. Where a separate exhaust fan is used, as in a kitchen, it can be connected to this vent.

*Combination unit.** There has recently been put on the market an interesting device combining in one unit all of the apparatus necessary for a successful forced-air heating system: a gas-burning, warm-air furnace, a humidifier, a viscous oil filter, a blower, and full automatic controls. At present the manufacturers are working on a summer cooling unit to be added to the above as soon as perfected.

CENTRALIZED DUCT SYSTEM: RADIATORS

A centralized duct system essentially similar to the above can be used employing radiators instead of the actual outside surface of the furnace to heat the air.

Advantages. This arrangement, while sharing in almost all the merits of the direct warm-air system, has several further advantages. By the use of a boiler instead of a furnace the domestic hot water supply can be automatically heated the year round. A greater freedom is allowed in the arrangement of equipment as the boiler can be placed in one part of the basement and the ducts and radiators in another. This separation of the air from direct contact with the furnace will eliminate all possibility of danger from escaping combustion gases as well as reduce the noise resulting from oil-burner equipment. In a large house the ducts need not all be brought to one point, but several different heating centers can be established, perhaps controlled by different thermostats. This, however, should not be carried too far as most of the advantages of a centralized duct system may be lost.

One of the greatest merits of this arrangement is that direct radiators can be used to supplement the duct system wherever it seems desirable, as for example in remote rooms to which it may be difficult to carry ducts, in rooms subjected to an unusually severe exposure, or in special rooms such as garages and kitchens where humidity is not needed and from which it is not desirable to recirculate air.

Disadvantage. The cost will usually be much more than where a furnace is used. This may be somewhat compensated for by the fact that a separate hot water heater is not required.

RADIATOR SYSTEM: DIRECT OR SEMI-INDIRECT

Exposed radiator—unclean, objectionable in looks, and consuming of floor space—and the lack of humidification have probably constituted the two most serious objections to the radiator system of heating. The former can now largely be removed by the use of the new compact sheet metal radiators specially made to be built in the wall, and the latter by installation of a sufficient number of adequate unit humidifiers. Exposed radiators are to be avoided especially in bathrooms where an unclothed person may bump against them and get burned. Where there is insufficient space to build in a bathroom radiator or the expense is objectionable there can be procured a special sheet metal radiator small enough in size to go under the lavatory where it is out of the way. As this type of radiator is placed off the floor it is easy to clean underneath.

Steam and vapor. A steam system is the cheapest to install as the radiators are small and only one pipe to each radiator is required. The temperature of the radiators is, however, extremely hot and may constitute a serious danger with children if left exposed. Vapor requires slightly larger radiators than steam, but they are not quite so hot. The output of heat from a vapor radiator can be more accurately controlled by the valve than with either steam or hot water. Both steam and vapor have the advantage over hot water that the domestic hot water supply can always be automatically heated without the expense and complication of motor valves.

Hot water. If hot water heat is used, considerably larger radiators will be required but they will seldom be dangerously hot. While hot water heat may produce a more uniform radiator temperature it has a very considerable drag, being both slow to heat up and slow to cool off, a quality highly objectionable in bedroom radiators. With a thermostatically controlled system this drag may also be the cause of uncomfortable overheating when a warm morning, as in spring or fall, follows a cold night. Just before the sun rises the thermostat may call for heat. A few hours later, with the sun up and all the radiators full of hot water, the temperature of the house may rise as high as 75° or even 80°.

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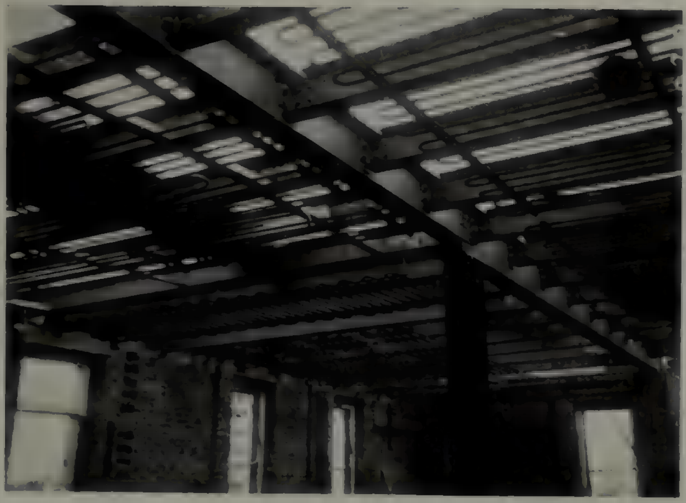
* Manufactured by the Carrier-Lyle Corporation of Newark, New Jersey.

In order to reduce this drag and produce more rapid circulation, thus requiring a smaller boiler and smaller pipes and radiators, it is now not uncommon to use a small auxiliary pump in the same way that an auxiliary fan is used in a warm-air system. As with a warm-air system it is also possible by this means to locate the boiler on the first floor and thus completely do without a basement.

PANEL HEATING SYSTEM

There has recently been developed in England, and now first introduced into this country in the British Embassy in Washington, a new type of patented heating system consisting of concealed hot water pipes placed in the ceiling.* While originally developed as the result of a desire to eliminate exposed radiators and grills it was subsequently discovered that radically new heating principles were involved offering decided advantages.

Principle of operation. The basic arrangement is in all essentials similar to a regular hot water heating system except that, instead of exposed or concealed radiators, coils with welded joints and tested under high pressure are placed in the ceiling just above its lower surface and buried in the plaster, which is of a special type to prevent cracking. Hot water is circulated at a relatively low temperature either by gravity or by pump. By means of these coils the plaster is raised in temperature to a point where the heat radiated from its lower surface is sufficient to warm the room to the desired point. However, as the air cannot be warmed by convection, owing to the location of the source of heat at the top of the room, and as radiant heat does not appreciably warm the air through which it passes, the air in the room is left at a relatively low temperature. The comfort of the occupants does not depend primarily on the warmth of the air but on the heat radiated by the ceiling, in the same way that a person sitting in a protected sunny spot on a cold winter day may be adequately warmed by the radiant heat of the sun although the air may be very cold. The inventors claim that a room heated by the panel system will be entirely comfortable with the air at a temperature of only 62°, and further that with the air heated above that point a sensation of serious overheating will be experienced.** The recent work of the New York State Commission on Ventilation has shown the dangers to health of overheating, and the importance of a matter of even two or three degrees. This commission recommends that the air temperature be maintained as low as is consistent with comfort, and panel heating may provide a means for comfort at a temperature far below that possible with any other system of heating.



PANEL HEATING CONSTRUCTION
BRITISH EMBASSY, WASHINGTON

At the present time, however, the development of the system is still in its infancy and there are many questions yet to be answered. For example, just how is such radiant heat to be thermostatically controlled, and how is the temperature of the air to be properly correlated with the amount of radiant heat? How is a desirable air motion to be procured when there are no convection currents?

Results of employing radiant heat. A most interesting feature of the system is told in the following quotation taken from the test data made in connection with the British Embassy installation:

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* Richard Crittall & Co., Ltd., of London, control the patents; Wolff & Munier, Inc., 222 East 41st Street, New York, are American agents.

** The humidity conditions accompanying these temperatures are not given in their statement.

> "One notable detail of these tests was that the air in the rooms tested felt slightly cooler when one walked briskly through the room than when standing still—a result entirely consistent with the theory that the comfort experienced in the relatively cool air was due to the direct 'pick-up' of radiant heat by the body and clothes. Brisk movement does not change the amount of radiant heat picked up; but by creating an appreciable velocity of the relatively cool air in contact with the body, it somewhat increases the absorption of heat from the body. This should partly counteract the common tendency to become overheated by dancing, or by any other exertion, which is so noticeable in rooms heated by the ordinary methods; and should be a distinct factor in creating additional comfort for those so occupied, when in panel-heated rooms. It is a well-known physiological fact, that slight variations in the effective temperature to which the body is subjected have a tonic and stimulating effect; and this result of panel heating will provide such an effect just at the time (when exerting oneself) it is most valuable. Conversely, whereas with the ordinary heating system one who has been exerting himself may feel chilly upon sitting down or lying down, with panel heating, as soon as he is still, it will appear as though the air temperature had been slightly increased."

It is probable that owing to the ever-present radiant heat and the lower required air temperature it will be possible with this system to have the windows open much more than at present, not only in the spring and fall but during colder weather as well.

As ordinarily installed insulation is applied above the coils so as to avoid overheating the floor surfaces directly above. In the case of bathroom floors, especially if tile, this insulation could well be omitted, thus permitting them to be heated so as to be comfortable to the bare feet.

Possible development. Suggested by the panel system is the possibility of covering the entire ceiling with exposed heated electric elements. These could be of the heat-producing type used in infra-red lamps or, if desired, light and perhaps even ultra-violet rays could be given off as well. The radiant heat from such elements would be so much greater than that produced by the surface of the ceiling in the panel system that it might be possible to maintain very low air temperatures or even completely to disregard the temperature of the air. One advantage of this system would be that if there were means provided to prevent the water pipes from freezing the heat in a room would never have to be turned on unless the room was occupied.

FUELS

COAL

With the development of small mechanical stokers adaptable to domestic use, certain advantages of automatically controlled heat are now possible even with coal. These stokers are designed to burn both hard and soft coal screenings; where hard coal is used the ashes are automatically removed and deposited in a can, and where soft coal is used clinkers are formed which must be removed by hand.

Disadvantages. In addition to the inconvenience of having manually to fill the hopper of the machine and dispose of clinkers or ashes the coal stoker has the disadvantage as compared with other forms of mechanically controlled heat that it cannot start and stop itself. Having once been started it will run until turned off and then with the return of cold weather must be started again, a situation which may constitute a serious inconvenience during the spring and fall. However, if used in connection with an automatic year-round domestic hot water heating system, this objection would be completely eliminated as the stoker would then be kept in constant operation. It might also be possible to eliminate the manual filling of the hopper by providing a coal bin in such a way as to feed into the hopper by gravity.

Advantages. The coal stoker has the advantage that it produces no odors or oily soot, and that there is no danger of explosion.

OIL

Advantages. The greatest advantage of oil heat is probably not its convenience or possible economy but that it is fully automatic, thus insuring a constant temperature in the house at all times—fall, winter and spring—regardless of the greatest and most sudden outside temperature change. In addition, it does not require more than periodic attention, perhaps running an entire season with nothing more than a few oilings. No basement storage space for fuel is required.

Disadvantages. In addition to the possibility of odors, soot and danger from fire, the major objection to oil heat has been the considerable noise usually produced. This is the result of two different causes, the mechanical operation of the burner itself and the combustion of the oil in the fire box. The latter varies with the type of flame produced. The former is usually more apt to be objectionable where the burner is attached directly to the boiler, thus permitting the noise to be conducted through the house by means of the heating pipes. Where possible the boiler should be located under the service portion of the house rather than under the living or dining rooms. If the burner is of a type that can be mounted on a sound-deadening pad on the concrete floor, then the entire boiler and burner could be enclosed in a small room with sound-proof walls and ceiling. If the sound-proofing used is good for heat insulation as well, it will also serve to confine what heat may be produced by the summer operation of the boiler in connection with the domestic hot water supply. Such a small furnace room would have the further advantage of preventing the spread of any odors resulting from the use of oil. In this connection special attention should be called to the necessity of providing a small air inlet to furnish the air needed for combustion. The lack of air is a common cause of trouble with oil burners and even where the boiler is placed in a large basement it would be well to provide a small opening in the outside wall which would always remain open.

Boilers. With the introduction of oil burners, special boilers have been designed to operate more efficiently with this type of heat. As the shape and type of flame as well as the basic method of operation may vary greatly with different makes of oil burners the general type at least should be decided upon before specifying a boiler.

Low water cut-off. If steam or vapor heat is used it is good insurance against a burnt-out boiler to specify a low water cut-off connected into the electric line to the burner.

GAS

Advantages. Although fairly expensive in many parts of the country gas is certainly the most convenient fuel in common use today. In addition to having all the advantages of oil, it is relatively noiseless and it is not necessary to order fuel. The total initial cost will be less as no storage tank is required and as the burner and boiler usually constitute a combined unit. It is not necessary to provide a driveway capable of withstanding heavy trucks, and the boiler or furnace can be placed in any part of the house most convenient without regard to the fuel supply.

Unit system. An interesting system of gas heating, consisting of individual units and permitting separate thermostatic control of each room, has recently been put on the market.* In each room is placed a radiator inside of which gas is burned. The products of combustion pass through the different sections of the radiator, are drawn off through a small pipe by an exhaust fan and finally expelled to the air either through a chimney or a pipe. A partial vacuum is maintained by the fan within the radiator and exhaust line, and an automatic switch is so arranged that if the vacuum is ever broken, through a leak or through failure of the fan, all the burners are shut off.

ELECTRICITY

Advantages. Electricity has the advantage over gas and oil that it is absolutely clean and noiseless, and that by its use in conjunction with an electric cooking stove all open flames may be avoided, thus reducing the fire hazard to a minimum. By its use it is even possible completely to do without any chimney, a fact which may in the future give it a certain economic advantage where initial building costs must be kept at a minimum.

Off-peak storage system. The most economical system of using electricity is that by which heat is stored in water during the night and then the hot water is circulated through radiators during the day time. This system is fully automatic in operation and has been used successfully in Europe for some years.** But even though it takes advantage of low off-peak night rates it will probably only be found possible where electricity can be procured at a cost not exceeding one cent per kilowatt-hour. Even at this price its use may be quite expensive and thorough insulation of the entire house, including the basement, and double-glazing as well, would probably be advisable.

Unit system. Where the day rates on electricity are not too high individual units may be placed in each room, consisting of heated elements exposed directly to the air. This arrangement has the advantage that each room can be controlled independently of every other room, and that no room need be heated except when occupied. An additional possible method for heating directly by electricity is suggested at the end of the discussion on the panel heating system.

AUTOMATIC CONTROLS

Advantages. The greatest single improvement in heating methods that has been developed during the last generation is the introduction of automatic controls. They make possible the maintenance of a uniform house temperature regardless of weather changes. The value of this is greatest in both comfort and economy not during the coldest winter weather, but during the spring and fall when the outside temperature fluctuations are most extreme, sudden and irregular.

Variability of heat. While it is highly desirable to prevent underheating and especially overheating common with any manually controlled system it is at the same time not necessary to try to keep the temperature absolutely uniform. A certain fluctuation about a predetermined point is probably beneficial as is indicated by Dr. Ellsworth Huntington's statement that "a variable climate is in general much more healthful than a uniform climate even though the latter has an almost ideal temperature". Most thermostats have a differential of only one or two degrees Fahrenheit. It might well be desirable to increase this differential to three or four degrees, thus not only introducing a more healthful variation into the extreme monotony of present-day heating but also causing the burner, while running longer each time, to operate less frequently. Under the present system of controlled heating what fluctuations exist usually are the result of poor distribution and while perhaps not objectionable to a person moving about result only in discomfort to a person sitting or working in one place.

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* Manufactured by the Roberts-Jordan Appliance Corporation, Curtis Building, Buffalo.

** It is being developed in this country by the Hall Electric Company, Inc., 1429 Walnut Street, Philadelphia, Pa.

Location of thermostat. Where only one thermostat is employed to control an entire house its location is of great importance and every effort should be made to design as carefully a balanced heating system as possible. The thermostat should not be located in the front hall where cold air may blow on it and turn on the heat everytime the front door is opened. Neither should it be located in any room with a used fireplace as the heat from the fire will shut off the thermostat regardless of how great the need for heat may be in the rest of the house. The thermostat should be located in as typical a part of the house as possible and not near radiators or registers, or on an outside wall. It should also never be placed on a wall near concealed air ducts or water pipes. The predetermining of the best location may be very difficult and it is now possible to provide at the time of building several electric outlets in different parts of the house. A portable thermostat of a type made to rest on a table or bookcase may then be used where conditions prove best. Such a thermostat placed in the center of a room may give better results than one permanently attached to the wall and also be less objectionable in appearance.

Clock thermostats. There is considerable question as to the advisability of employing clock thermostats by the use of which it is possible to maintain a lower night temperature. Whether it is better to keep the house warm all night or to let it get cold and then warm it up in the morning may depend on the type of heating used. While a theoretical saving in fuel may result from this system it is apt to be somewhat of a nuisance and its operation may be neglected by the owner even where an 8-day clock is used. If the saving in fuel is worthwhile at all it is probably worth the slight extra cost necessary to install a fully automatic system controlled by an electric clock. Where the owner desires to raise potted plants in a house the possible effect of a lower night temperature should be considered.

Suggestions for more extended use of controls. In spite of the improvement in heating that has been made possible by automatic controls and regulating devices, their use in residential work is still very limited and the possibilities resulting from their more extended application are only beginning to be appreciated. Various parts of a house subject to different exposures and used for different purposes may be advantageously controlled by separate thermostats especially if the heating system is of a type which permits this to be easily accomplished. The average private garage, for example, unless used as a workshop need never be heated more than just above freezing. This temperature can be accurately maintained by a thermostat, but to depend on the hand-control of valves may only result in frozen water pipes during some cold snap.

Control of night temperature in bedrooms. The bedroom presents a heretofore unexplored field for the application of controlled heat. It has been suggested that as most bedrooms in the average house remain unoccupied during much of the day they be left unheated when not in use but equipped with some form of electric or other heat which will permit their being brought very rapidly to the required temperature when needed. While such a system, if ever worked out, may have the advantage of economy of operation, the question of the proper control of the night temperature of bedrooms seems to be far more important in that it effects both comfort and health. While many persons may be able to sleep night after night with unfailing comfort in the middle of winter under the present system by which the heat is turned off and the windows are opened, there are many others who, while wishing to enjoy all the advantages of fresh moving air and a low temperature, are continually troubled with the cold. This situation is due not to the intensity of the cold but to the extreme variation of temperature. If a bedroom in winter were approximately the same temperature all night and every night no matter how low that temperature might be a sleeper by the use of more or heavier blankets could adjust himself to the existing conditions and be entirely comfortable. As a matter of fact, however, there is the greatest possible variation from night to night as well as during each night. At the time of undressing and going to bed the room will probably be about 70° and although the sleeper turns off the radiator and opens the window it may take several hours before the room has completely cooled off, the exact time depending on the amount of cross draft and the type of heat used. A hot water radiator will frequently stay hot for several hours. If the sleeper covers himself with only enough blankets to be comfortable during the early part of the night he will be cold later, or, what is equally bad, if he uses enough blankets to be warm later he will be too hot to begin with. Even when, with the help of a good cross draft and a form of heat that can be completely shut off, the room can be at once cooled to the desired point, there is still the nightly fluctuations in the outdoor temperature and the even greater unpredictable variation from night to night.

The problem can probably be completely solved by the proper use of thermostatic controls. Each bedroom should be equipped with a clock thermostat with a range from about 30° to 70°. This thermostat would control the source of heat to the room by an electric valve, if the heating was by radiation, or by an electrically operated damper, if by warm air. At bedtime, the thermostat would be set for the desired night temperature, a temperature at which the sleeper knows he will be entirely comfortable with a certain number of blankets, and the window would be opened an amount varying with outside conditions. The thermostat will turn the heat on and off during the night so as to maintain approximately the desired temperature. A short while before it is time to get up, the clock on the thermostat will raise the setting to 70° and there will be heat ready in the radiators to warm the room quickly when the window is shut. (Incidentally, the window can also be closed automatically at the same time the heat comes on, by a small device now on the market at a low price.)

FAILURE OF HEATING PLANT

With a mechanically operated heating plant the possibility of its failure may present an important problem, especially where the climate is severe, the electric service is subject to failure, or the location of the building is remote.

Precautions. If an oil burner is to be used the reliability of the local repair service is of the utmost importance. To provide against emergencies where a house is being built in a remote location or where unusually heavy snows are common, there should be specified an extra large storage tank for oil. Further to prevent the possibility of running out of oil a gauge should be provided, placed in a regularly used part of the house where it will frequently be seen. Many oil burners at present require the use of gas as well as of oil and electricity. Where there is no gas or the gas supply is apt to fail, a burner can be procured which will start with an electric spark.

The necessary electric controls for a gas system may be operated in an emergency by a storage battery kept automatically charged by the current when on.

In case of failure. But in spite of precautions a failure is always possible. In such an emergency fireplaces may be of slight value in keeping the house warm. In most present-day dwellings fireplaces are only provided as an unnecessary luxury in a few of the most important rooms and so are inadequate to prevent the freezing of water pipes in the more distant parts of the house. A few small portable oil heaters if kept on hand might be used to supplement the fireplaces.

The double-duty boiler provides one definite solution to the problem. This type of boiler has two fire boxes, one at each end of the boiler, and each with a separate door. The larger of the fire boxes is used for the oil burner and the smaller as a garbage incinerator. The latter is equipped with grates and during an emergency either coal, a small supply of which may be kept on hand for this purpose, or fireplace wood may be conveniently burned in it, thus keeping the house warm. Certain oil burners are arranged in such a way that they can be removed and temporary grates used during an emergency. While perhaps possible as a last resort, such an arrangement should not be counted upon in a location where the necessary electric supply is subject to failure.

HUMIDIFICATION

Humidity as important as temperature. Humidification presents a problem inseparably connected with heating, yet a problem almost completely disregarded in house design until within the last few years, and still insufficiently studied. The effect of the air is dependent as much on humidity as temperature. The recent work of the American Society of Heating and Ventilating Engineers done in conjunction with the United States Public Health Service and United States Bureau of Mines has clearly demonstrated that as far as sensations of warmness and coolness are concerned it is immaterial whether the temperature is, for example, 74° with a humidity of 20% or 66° with a humidity of 80%. There is, however, a very considerable difference in the comfort, healthfulness and cost of these two conditions.

Healthfulness. That the lower temperature, made possible by the higher humidity, is more desirable from the health point of view is indicated by the work of the New York State Commission on Ventilation. Experiments conducted in school rooms over a period of two years tend to show that a rise of only two degrees in temperature, from 66.5° to 68.5°, was responsible for an 18% increase in absences due to respiratory sickness and a 70% increase in respiratory sickness among pupils in attendance. In the opinion of this committee the maintenance of low temperatures is by far the most important problem of ventilation. Low temperatures are made comfortable by a high humidity. That a high humidity is in itself healthful has been demonstrated by the exhaustive study of Professor Ellsworth Huntington of Yale. As a result of a careful analysis of weather reports in relation to sixty million deaths in all parts of the world, Dr. Huntington was able to show that a humidity of 80% is associated with a minimum general death rate and that a higher or lower humidity was accompanied by an increase in mortality. Factory work was also shown to be more efficient at a high humidity, and in studying deviations from the normal for any given month a high humidity produced more favorable conditions unless accompanied by an abnormally high temperature.

Comfort. That a low temperature with a high humidity is far more comfortable than a high temperture with low humidity is obvious. Air of low humidity absorbs moisture from the skin and mucous membrane of the nose and throat producing a dried-out sensation usually accompanied with a nervous keyed-up condition. Cool air with a high humidity on the other hand will have a pleasant freshness producing a sensation similar to that of the outside atmosphere of spring and fall.

Cost. From the point of view of cost it is obviously more economical to heat a building to 66° than it is to heat it to 74°. This, however, cannot be considered as an entirely clear gain, since the process of humidification involves certain initial costs as well as operating expenses.

Present conditions. In connection with Dr. Huntington's recommendation of 80% relative humidity, it is interesting to note the conditions normally existing in unhumidified houses in the middle of winter at the present time. The average probably falls between 20 and 25%, frequently dropping as low as 15% and seldom reaching 30%. This is even lower than the 33% average for the Sahara desert and considerably lower than the 44% average for the Colorado desert. Houses humidified with the usual type of humidifier now on the market will probably not average over 45% and many of them will fall even below that point.

CONDENSATION

The one great inconvenience accompanying a high humidity, and probably the greatest single obstacle to its more universal acceptance, is condensation. With well-insulated walls, however, condensation will occur only on the windows, where it can be taken care of, or even largely eliminated except during the coldest weather.

Remedies: condensation gutters, double glazing. There is nothing inherently objectionable to condensation. In fact, to those persons who appreciate the comfort of a high humidity its presence is a pleasing indication that there is probably at least a fair amount of moisture in the atmosphere. Condensation is, however, the cause of two just complaints: windows covered with condensation cannot be seen through, and when the surplus moisture of condensation runs down off the glass it forms pools of water on the sills which may stain the curtains and walls. The latter objection can be entirely removed by the provision of adequate condensation gutters to carry off this water. Both objections can be reduced to a minimum by the use of double glazing. In addition to largely preventing condensation this has the further advantage that it reduces the total air infiltration and heat loss from the building,* thus saving fuel. Charts prepared by the University of Illinois show that with an inside temperature of 69° and a humidity of 60% condensation will occur on single glass when the outside temperature is only 48 degrees, but will not occur on double glass until the temperature is as low as 19 degrees. Or, expressing this differently, with an outside temperature of 20° condensation will occur on single glass when the humidity reaches 30%, but will not occur on double glass until it reaches 60% Even with zero weather outside double glazing will permit a humidity of approximately 50% unaccompanied by any condensation whatever. The ultimate solution to the problem of condensation as well as heat loss may be found in the vacuumized window pane.

Double glazing can be accomplished in a variety of ways, but the most important requirement is airtightness. Both sheets of glass may be set permanently in the same frame, but in this case the glazing should be done during weather as dry as possible. For greatest efficiency the air space between the glass should not be less than one inch in thickness. Even if the glazing is relatively airtight, dirt will eventually filter in and the glass will require cleaning, which will be difficult to accomplish unless provision is made for the easy removal of the glass. Where such double glazing is contemplated in connection with steel sash it should be remembered that moisture may condense on the interior surface of the metal even if the glass is double. It will usually be found more satisfactory to provide entirely separate frames and glass, placed either inside or outside of the regular window, and stored during the summer. These can be made completely interchangeable with the screens, the same hinges or fasteners being used for both and the putting up of the screens and taking down of the winter sash accomplished at one operation. In order to get as airtight a fit as possible it may be worthwhile to use weather-stripping, perhaps of the cloth-lined variety.

Another way of preventing condensation would be through the direct heating of the glass to a temperature above the dew-point. This method has already been employed to prevent condensation (as well as the accumulation of sleet) on automobile windshields, the heating being accomplished electrically by means of a small element placed in contact with the inside surface of the glass.

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* The coefficient of transmission expressed in B.t.u. per hour per square foot per degree Fahrenheit difference in temperature with a wind exposure of 15 miles per hour is, for single glass: 1.13; for double glass .45; for triple glass .281. These values are based on a width of air space between the panes of glass of not less than 1 inch.

Methods for determining humidity. A word should be said concerning the proper means of determining humidity conditions as methods commonly in use are wholly unreliable. The device known as the horse-hair hygrometer is the most convenient in that it gives a direct reading in relative humidity without the use of tables or graphs. It is, however, inaccurate at best, and should never be used unless checked daily with a master instrument. The only reliable instrument, which happens also to be both the cheapest and most accurate, is the wet and dry bulb thermometer. While these instruments are everywhere in common use, it is not usually mentioned in the furnished directions that for results even approximately correct it is necessary to fan the wet bulb until the mercury ceases to fall. The tables are based on an air flow of approximately 600 feet per minute which is not easy to maintain by hand fanning for the minute or so usually required. An electric fan may be used; or a sling psychrometer, a similar instrument made in a form to be swung rapidly in the air, will be found convenient.

METHODS OF HUMIDIFICATION

Elements to be considered. First of all a humidifying device should be adequate to maintain the desired amount of humidity. What this amount may be will depend principally on the feelings of the individuals occupying the house and on such considerations as the prevailing outside winter temperature and the provision made for condensation. The absolute minimum will probably be in the neighborhood of 45% and the maximum around 65% or 70%. Under present conditions the ideal of 80% based on Dr. Huntington's research is difficult to attain without excessive condensation. Although outside and inside air temperatures will have some bearing on the ability of a humidifier to produce given results, the most important consideration is the airtightness of the house. An excessive number of air changes per hour will require the evaporation of very much more moisture and so place a much greater demand on the humidifier.

Another important consideration is the ability of the humidifier to produce an even distribution of moisture throughout the entire house. In bedrooms not commonly occupied except at night humidification is, however, of no great importance. The kitchen and laundry need not be humidified as they are usually too warm and damp to begin with. Theoretically, moisture in the air will spread equally in all directions and produce a uniform humidity throughout any given space regardless of air currents and the location of the source. In practice, however, this will not be found to be the case because the change of air in the house takes place more rapidly than the distribution of the water vapor.

Low cost, both of installation and operation, quietness and ease of control are other important considerations. It goes without saying that no humidifying device should even be considered which depends on manual filling and in addition to being self-operating automatic control is desirable. The advantages of the automatic control of humidity are similar to those of the automatic control of heat, but there may be an even more important reason where a relatively high humidity is to be maintained. With certain types of humidifiers there is considerable danger that without automatic control on a sudden arrival in early spring of a warm calm day the saturation point might be reached and moisture be deposited all over the walls and furniture. Humidity controls depending on the expansion and contraction of some hygroscopic material such as balsa or animal membrane are, however, almost as simple as thermostats and as accurate and reliable.

Centralized system. Those means of humidification used in connection with a warm-air system or a centralized duct arrangement have many advantages. An even distribution throughout the house is, of course, obtained, and where a noise may be produced it can be eliminated by offsetting the ducts and lining them with hair felt for a short distance. Pans placed over warm-air furnaces, even when fed by a float valve, are usually of little value. In order for the pan method to be effective a large water surface must be exposed and the water must be heated to the steaming point, which can usually only be accomplished by means of immersed steam coils. (With any method of this kind there is apt to be a considerable deposit of lime where the water is hard.)

With a warm-air system good results can be accomplished at a minimum of expense by the drip method. This involves nothing more than letting water controlled by a needle-valve drop in one or more places, either directly on top of the hot dome of the furnace or on a piece of sheet metal placed just above the dome. The surplus in spring and fall can run off through a floor drain, or the flow may be regulated by an electric valve automatically turned on and off by a humidity control. One device of this kind is so made that its flow is regulated directly by an element that expands and contracts with the variation in temperature of the air, thus causing it to drip only when the furnace is operating.

A water spray has the advantage that in addition to producing a high humidity it serves to wash the air and even to cool it in summer. The water used for humidifying purposes will probably have to be heated unless, as with some systems, it is sprayed over hot radiators placed in the ducts. Where the domestic supply of hot water is heated by an expensive fuel this result can be accomplished economically by piping the supply to the humidifier through a small indirect coil tapped into the boiler, or where warm air is used, through an exposed coil in the firebox. Where no fan is used the force of the water spray will help materially in circulating the air through the system.

Separate units. Separate self-contained humidifying units made to be placed in the living portion of the house usually have a low capacity for humidification. Even where their output is great, however, the moisture will not be distributed equally throughout the house but will usually be confined principally to the nearby rooms. For this reason two or more units may be required in even a small house.

The most common system employed in this type of humidifier is probably the water spray, which usually has the disadvantage of being noisy. A somewhat similar but more efficient method depends on dripping water on to a rapidly revolving wheel edged with teeth. This breaks up the water into a fine mist and throws it out by centrifugal force into a small chamber through which air is circulated by a fan operated by the same motor as the wheel. The principle of flowing water over heated radiator surfaces is employed by several manufacturers.

One of the most promising devices produces steam in a specially designed coil placed in the firebox. After being piped to different parts of the house this is liberated directly into the atmosphere. Where steam heat is used this principle can, of course, be employed with the greatest ease by merely placing valves on radiators in different parts of the house, and installing an automatic boiler feed. When first tried out the steam may carry objectionable odors but there is no reason why this cannot be eliminated by a thorough cleaning of the system.

CLEANING AIR

Air entering house. In the city, soot and dust may be so bad as to make it highly desirable to filter all air entering a house, but conditions in the suburbs and country are not likely to be such as to warrant this. Where, however, persons suffer from hay fever, the presence of pollen in the air may create another and perhaps even more vital problem. It is now possible by passing the air entering a house through a special bag, to remove completely all pollen particles from the atmosphere.*

Air within house. Even where the outside atmosphere may be clean, there usually accumulates within a house a considerable amount of air-borne dirt which makes constant dusting a necessity and results in considerable damage to walls and furnishings, especially in the vicinity of radiators and registers. If the house is heated by air recirculated through a centralized duct system, most of this air-borne dirt can be removed, as fast as it forms, by the use of a viscous oil filter. Where expense is not of the first importance this filter should be of the automatic type, as those depending on manual cleaning are apt to be neglected. Where a water spray is used for humidifying or cooling it will, of course, remove most of the dust from the air at the same time.

DE-ODORIZATION

Ozone. Manufacturers of ozone equipment have recommended its use for household de-odorization, especially in kitchens; and various small generators are now on the market. Even if the desired result could not be better produced by ventilation it is probable that the high humidity usually accompanying cooking operations would reduce the output of any such equipment to a point where it would be ineffective.

COOLING

The technique of air-cooling has already been developed in other fields. Its cost is the one obstacle to its immediate and almost universal use in residences. Although a temperature even as low as 86° is apt to cause real danger to the health of small children, in the greater part of America the heat is not so intense as to produce serious discomfort to adults on more than a relatively few days of each year, and so the initial cost of cooling equipment seems unjustified to the average householder. With the introduction of less expensive equipment, however, it is probable that air-coolers will become as common in houses as heating plants and be considered just as essential in those parts of the country where the summers are unusually hot.

Centralized system. There are at present several methods by which houses or parts of them can be cooled without too great expense provided double glazing and proper insulation is used. The method usually employed in theatres, consisting of a spray of either naturally or artificially cooled water, can be used equally well in houses and has the advantage that the uncooled spray may function as a humidifier in the winter time. Instead of the cold water spray it is possible to use in direct contact with the air an artificially refrigerated unit similar to those made to go in iceboxes, but designed with larger fins to handle greater volumes of air. Where a centralized duct arrangement is used for heating purposes these types of coolers for handling an entire house can be very easily installed.

Unit system. For the purpose of cooling a single room there is already on the market a special automatically controlled device** requiring no ducts and consisting merely of a metal cabinet containing a refrigerated unit such as is referred to above operated by a compressor installed elsewhere and a high speed fan to circulate the air over it. This device, costing about $600 installed, is guaranteed to produce a temperature drop of at least 10 degrees in a room not to exceed 600 square feet in floor area. With electricity at 3c. per kilowatt-hour the operating expenses would be approximately 5c. per hour. It is said that several other large manufacturers are also working on this problem, and that one of them is about to bring out a combination drinking-water and room cooler for offices which will cost but slightly more than the water cooler alone.

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* Manufactured by Pollenair, Inc., Hickox Building, Cleveland, Ohio.

** Manufactured by the Frigidaire Corporation, Dayton, Ohio.

De-humidification. Of equal importance with cooling is de-humidification. This is, however, automatically accomplished by the cooling process itself. When the warm air with a high humidity passes through the cold water spray or over the cooling coils it is greatly lowered in temperature to a point far below the dew-point and therefore loses all the excess moisture. Although the air will leave the refrigerating chamber 100% saturated it will contain only a fraction of the moisture that it had on entering and when its temperature is again raised as a result of the infiltration of heats its relative humidity will be low.

Desirable temperature. It may be supposed that as a temperature of approximately 68° is considered ideal, it will, with the ultimate development of house cooling, be desirable to keep the temperature down to that point during the summer months. This seems, however, more than doubtful, not only on account of the extra expense but because so low a temperature in summer is not necessary for complete comfort. In fact with the outside temperature at around 90° an actual feeling of chilliness will be experienced on entering a room with the air at only 68°. The most comfortable summer indoor temperature will probably rise with the rise in the outdoor temperature so as never to produce too extreme a difference.

Possible development. New possibilities in cheap house cooling are indicated by the work of Claude in Cuba. He is now engaged in building a power plant which will generate electricity by means of steam produced in a vacuum at atmospheric temperature and condensed by the very cold water brought up from the bottom of the ocean. After this water has served the purpose of condensing the steam, although still cold, it is of no further use to Claude and he proposes to furnish it at low cost to the residents of Havana to be pumped through radiators in their houses. He suggests that, if the supply from electric plants is not adequate, water might be specially pumped from the bottom of the ocean for this purpose and that it might even be used effectively out of doors in coils placed in the city streets.

EXHAUST FANS

Independent of any other heating or ventilating arrangements it is now customary to equip the kitchen with a small separate exhaust fan. This not only makes for comfort, but also helps to prevent odors from spreading throughout the house. For the same purposes it would usually be worthwhile to provide a fan in the laundry, especially if located in the basement with poor natural ventilation.

DOMESTIC HOT WATER SUPPLY

SEPARATE SYSTEM

The old-fashioned coal heater requiring daily attention has within the last few years been largely replaced by the automatic gas heater. Where, however, gas is not available or is too expensive the advantages of automatic control can be obtained by the use of a small oil burner.

Instantaneous heaters. For small residences, or wherever pipe runs are very short, instantaneous heaters not requiring a storage tank are available both for gas and electricity. Where the hot water consumption is low or its use is apt to be confined to intermittent periods this arrangement is especially desirable as it does away with the constant heat loss from storage tanks. There has also recently come on the market a small compact self-contained electric heater* complete with spout and valve which can be placed on the edge of the wash basin connected directly to the cold water supply line. When the faucet is turned one way cold water is delivered, when turned the other way the water is heated instantaneously, no further equipment of any kind being required. Such an arrangement might be of value in an out-building or week-end house.

COMBINED SYSTEM, AUXILIARY

It has been customary for many years to make use of the main house heating system during the winter to supplement the hot water heater, especially where a more expensive fuel was used for the latter. This was accomplished either by means of a water jacket, an exposed coil in the firebox, or an indirect coil, the latter usually a separate unit but now also available built into the boiler. During the winter months the water was either completely heated in this way or else the chill was taken off and then its temperature raised to the desired point by a separate heater. The only excuse for this system was that it permitted the substitution of a cheaper for a more expensive fuel, or that it necessitated the care of only one fire instead of two. Contrary to the popular theory there was but slight or no increase in total efficiency. Wherever a boiler is to be used for this double purpose it should be designed of a sufficient size to take care of the extra load.

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* Manufactured by the Electric Heater Corporation, Bridgeport, Connecticut.

AUTOMATIC YEAR-ROUND SYSTEM

With steam or vapor heat. With the introduction of oil burners it was found possible by use of an indirect coil in connection with a steam or vapor system to heat the domestic hot water supply automatically the year around. An aquastat with a range from about 150° to 180° is placed in the boiler, thus always maintaining the boiler water at a point hot enough to insure an adequate supply of domestic hot water heated by means of the indirect coil. At the same time the boiler water is never heated hot enough to produce steam unless the house thermostat calls for heat, in which case the burner will run until steam is produced and the house is heated in the usual manner. This system is fully automatic requiring no switches or valves. Regardless of the time of year the water is always hot and the house is never either over or underheated. Any arrangement which depends on the manual operation of valves or switches should be avoided.

With hot-water heat. Recently a similar fully automatic system has been worked out for hot-water heat. Each riser is equipped just above the boiler with a motor valve electrically controlled by means of the house thermostat. These valves open whenever the thermostat calls for heat and close when the desired point has been reached, thus maintaining the house at a constant temperature. Where there are several valves each one, if desired, may be controlled by a separate thermostat placed in that part of the house the heating of which is controlled by the valve. As in the previous arrangement the boiler water is constantly kept by an aquastat at a point sufficient to heat the domestic hot water supply by means of the indirect coil. Some hook-ups call for an extra control to be placed in the hot water storage tank but this is not necessary as the temperature of the water in the tank is controlled indirectly by that of the water in the boiler which in turn can be regulated by adjusting the aquastat. As by this arrangement the water in the boiler is kept at a relatively high temperature a more rapid circulation through the heating system will result when the valves in the risers are opened by the thermostat calling for heat. A certain amount of the drag usual with hot-water heat is thus eliminated. Where the indirect coil is used in connection with a hot-water system it should be placed on a level with the upper part of the boiler considerably higher than is usual with a steam system. In localities where the water is unusually hard it may be well to use a water softener to prevent the loss in efficiency which will result from the indirect coils being deposited with lime. A heater which combines in one unit the indirect coil, a large valve, and all of the necessary controls has recently been put on the market.*

Advantages. As a result of the development of these systems wherever oil burners are used there is no necessity for purchasing separate hot water heaters. In addition to the convenience, the cost of unnecessary equipment is saved and by keeping the burners in constant operation the year around there is no period of extended rest during which they can rust or get out of order. This system has, however, been objected to on the ground that it heats up the basement unnecessarily during the summer. If the boiler, indirect coil and tank are properly insulated this heating effect will be slight and will not be objectionable as it will only be sufficient to prevent the basement from getting damp—and this will be found true even where the boiler is unusually large. While operating most efficiently with oil the systems can also be employed equally well with gas or even coal where mechanically stoked.

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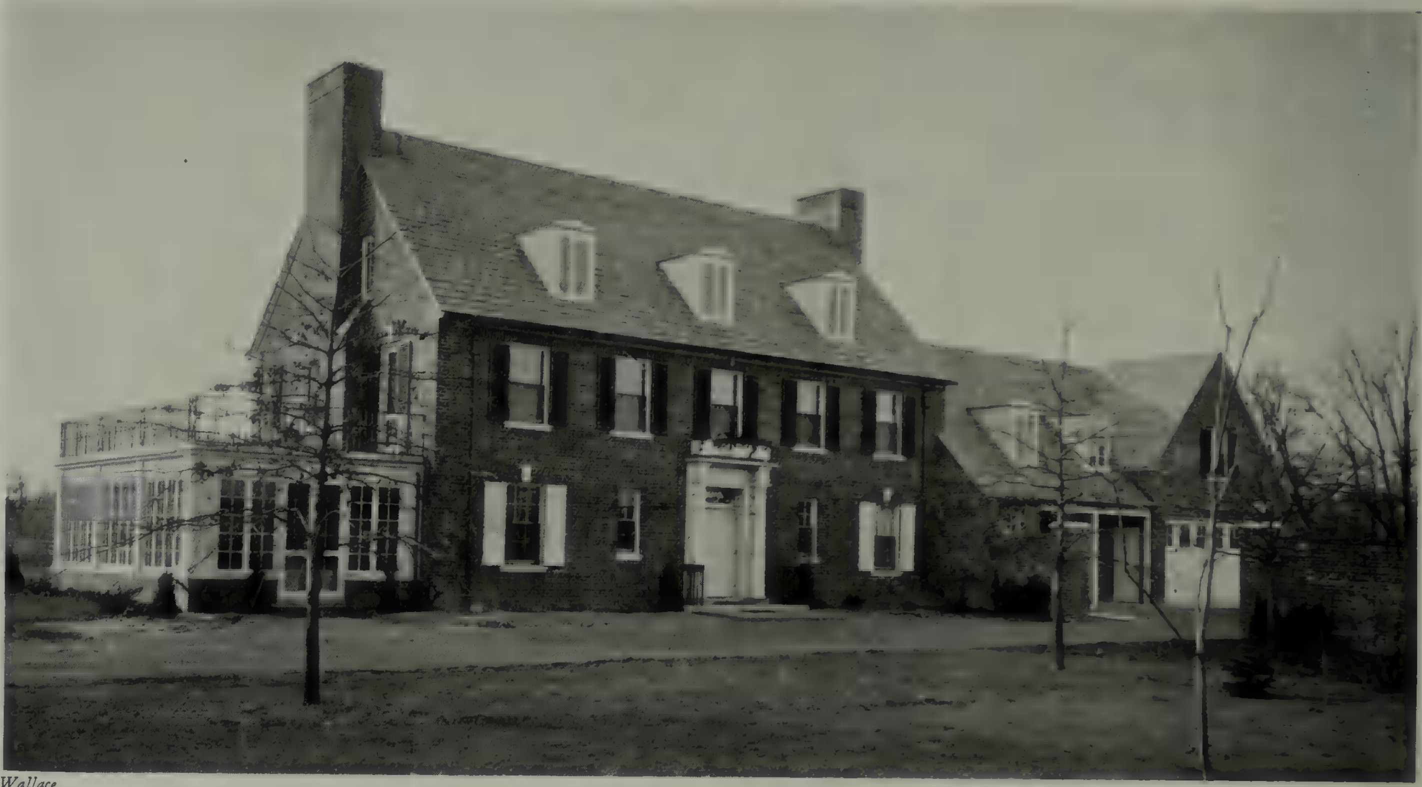
* Manufactured by Bell & Gassett Company, 3000 Wallace Street, Chicago.

CHECK LIST OF HOUSE REQUIREMENTS

- Sleeping porches:
  - Cross draft, open on at least two sides
  - Relation to bedroom, direct connection
  - Open or enclosed
  - Heated or unheated
- Dining porches:
  - Direct access from kitchen or pantry
  - Open or enclosed
- Sitting porches:
  - Cross draft
  - Privacy
  - Use of roof
- Roof porches and terraces:
  - Use
    - Sitting
    - Eating (service requirements)
    - Sleeping
    - Sunbathing (privacy, protection from wind), special room (heat)
    - Play
  - Layout—
    - Open terrace
    - Covered porch (screened)
  - Auxiliary equipment—
    - Lavatory
    - Telephone
    - Dumbwaiter
    - Outdoor fireplace
  - Stairs—
    - Exterior (accessible ground)
    - Interior (pent house or hatch)

- Waterproofing—
  - Canvas
  - Built-up membrane
  - Monolithic concrete (integral or surface waterproofing)
  - Welded metal
- Scuppers, interior downspouts
- Surfacing—
  - Canvas (painted)
  - Cement (over concrete)
  - Wooden slats
  - Earth with grass (flowers) and flagging (stone, slate, soapstone, brick, tile, concrete slabs)
- Sand with flagging
  - Gravel
  - Tile (slate) set in mastic (cement joints)
  - Rubber paving tile
  - Zenitherm
  - Wood blocks (end grain)
- Insulation—
  - Main roof, upper roof
  - Summer, winter
  - Type
  - Quantity (omit under gutters and around conductor heads)
- Parapets and railings—
  - Open for cross draft and visual outlook
  - Non-climable
  - Height: 35″ to 37″
- Soil stacks—
  - Can be carried up through pent house or in chimney
- Windows:
  - General considerations—
    - Fewer large units preferable to numerous small units
    - Ease of operation
    - Corner windows
    - Unbroken glass areas
    - Complete opening
  - Types—
    - Double-hung
    - Casement (opening in or out)
    - Sliding
    - Lowering into pockets
    - Sliding-folding
    - Windows opening to floor
  - Special window installations—
    - Windows for growing plants (heat, ventilation, drain)
    - Bedroom windows, to prevent rain from coming in
    - Ultra-violet glass
  - Double-glazing—
    - To prevent condensation and reduce heat loss
    - Storm sash interchangeable with screens
    - Airtightness
  - Fixed windows
  - Shutters—
    - Rolling steel shutters
  - Insect screens—
    - Outside
    - Inside (fixed, hinged, sliding, roll-up)
  - Curtains and shades—
    - Curtains (heavy, transparent)
    - Pulls
    - Concealed built-in curtain rods
    - Space for curtains at side
    - Venetian blinds
- Heating:
  - Centralized duct system (warm-air furnace or radiators)—
    - Gravity system
    - Combination system (booster fan and by-pass)
    - Forced-air system
    - Outside vs. recirculated air (adequate cold air returns)
  - Radiator system—
    - Direct or semi-indirect
    - Steam or vapor
    - Hot water (auxiliary pump)
    - Panel Heating system
  - Fuels—
    - Coal (manual firing or automatic stoking)
    - Oil (sound-deadening, low water cut-off)
    - Gas (central or unit system)
    - Electricity (off-peak storage system or unit system)
  - Automatic controls—
    - Location (portable thermostat)
    - Clock thermostat
    - Special uses (garage, bedrooms, etc.)
  - Failure of heating system—
    - Oil (reliability of repair service, large storage tank, oil gauge in conspicuous location, double-duty boiler)
    - Gas (storage battery to operate controls)
  - Fireplaces—
    - Built-in firescreen
    - Franklin stove
    - Wood storage
- Humidification:
  - General considerations—
    - Adequate capacity
    - Even distribution
    - Quietness
    - Self-operating
    - Automatic control
  - Centralized system—
    - Pans (water must be heated)
    - Drip
    - Water spray (water heated or sprayed over radiator)
  - Individual units—
    - Water spray
    - Humidifying radiators
    - Steam
- Cleaning air:
  - Air entering house (hay-fever pollen)
  - Air within house
  - Methods—
    - Viscous oil filter (manual or automatic)
    - Water spray
- De-odorization:
  - Ozone
- Cooling:
  - Centralized system—
    - Waterspray
    - Refrigerated coils
  - Unit system
  - De-humidification
- Exhaust fans:
  - Kitchen
  - Laundry
- Domestic hot water supply:
  - Separate system—
    - Instantaneous heater (gas or electric, central or unit)
  - Combined system—
    - Auxiliary
    - Automatic year around (steam, vapor or hot water)



Wallace

HOUSE OF M. ALBERT LINTON
MOORESTOWN, N. J.
EDWARDS AND HOFFMAN, ARCHITECTS

Site: deep lot with narrow end toward the road and facing south.

Roof: variegated gray and green slate.

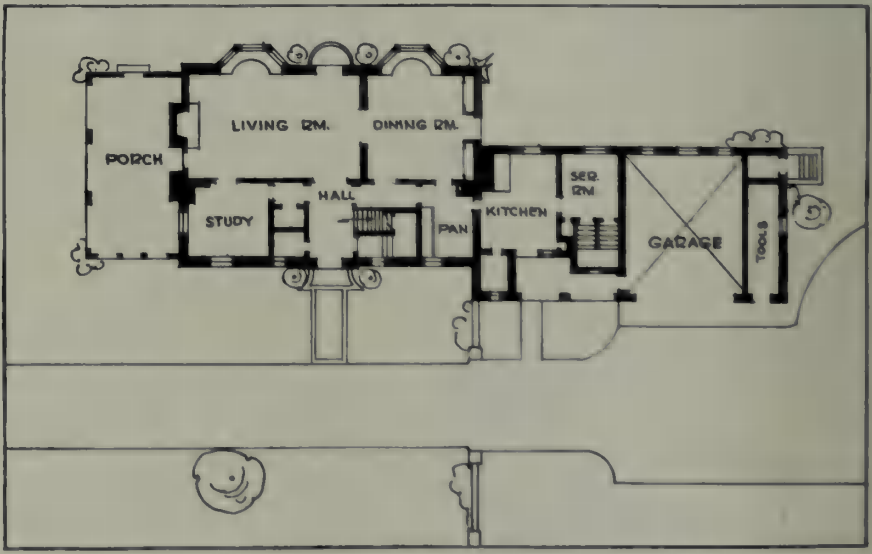
Chimneys: common hard-burned brick with stone caps.

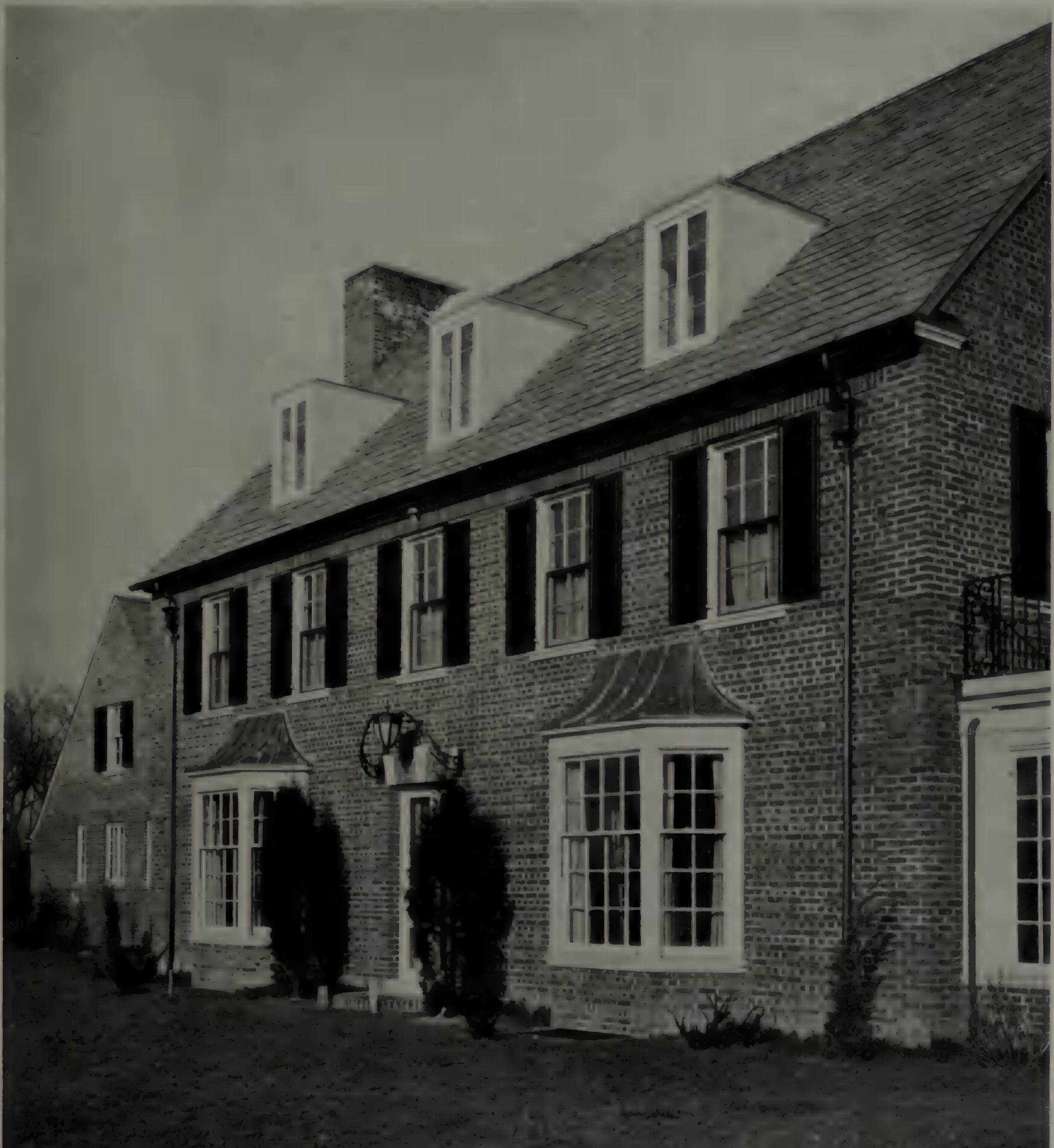
Windows: double hung wood sash.

Walls: common hard-burned brick with struck joints.

Color scheme: brick work, dark red; windows, deep cream; shutters, very dark green; iron work, black.

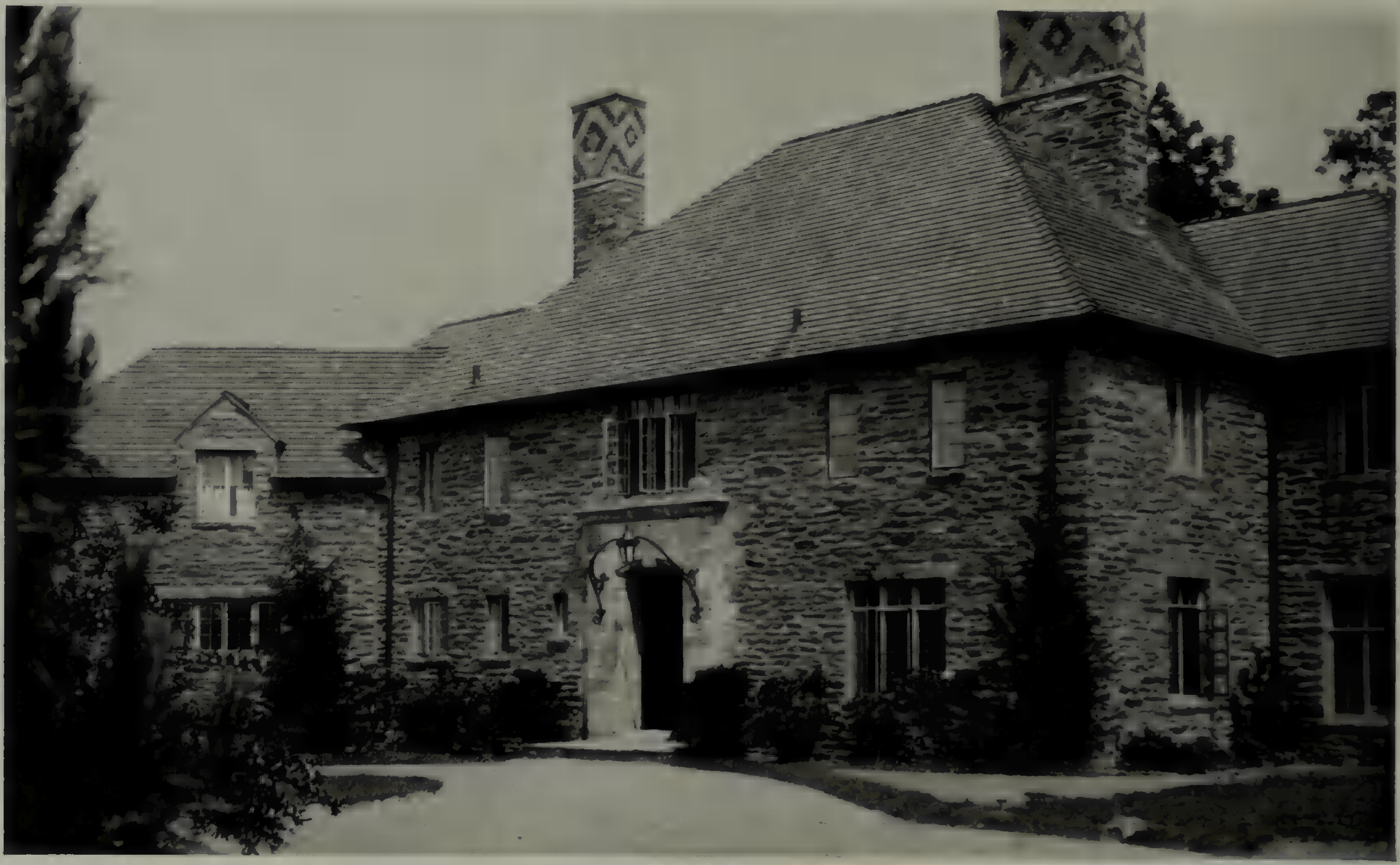
Cost per cu. ft.: 80c.



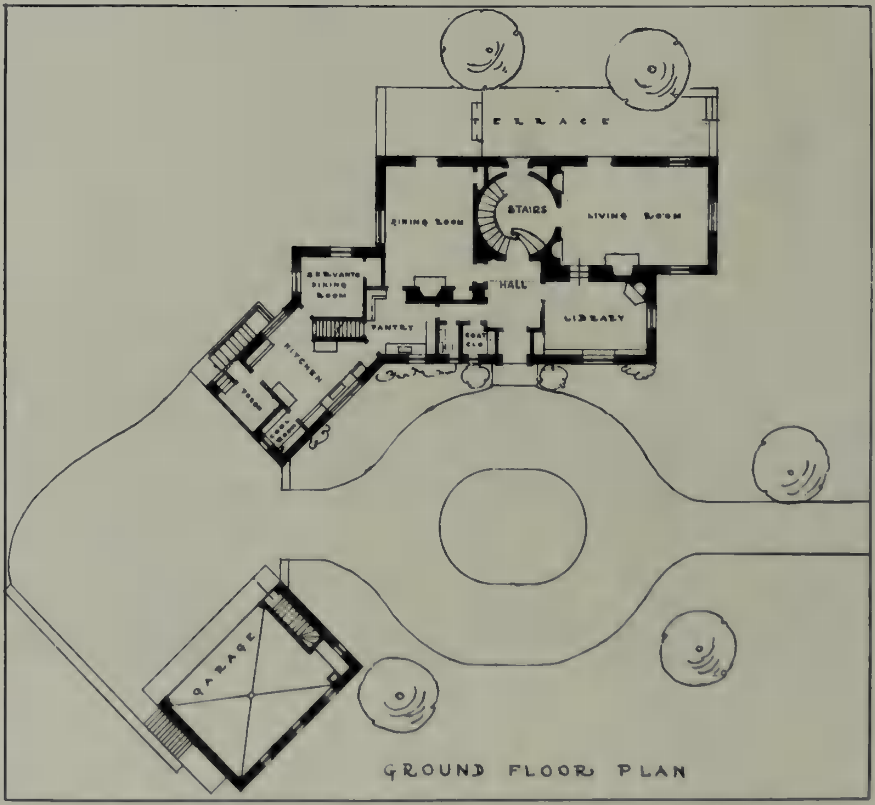


Wallace

HOUSE OF M. ALBERT LINTON
MOORESTOWN, N. J.
EDWARDS AND HOFFMAN, ARCHITECTS



HOUSE OF MRS. JOHN D. NEWBOLD, JR.
CHESTNUT HILL, PA.
EDWARDS AND HOFFMAN, ARCHITECTS



Site: house faces north and south on crest of a hill.

Roof: shingle.

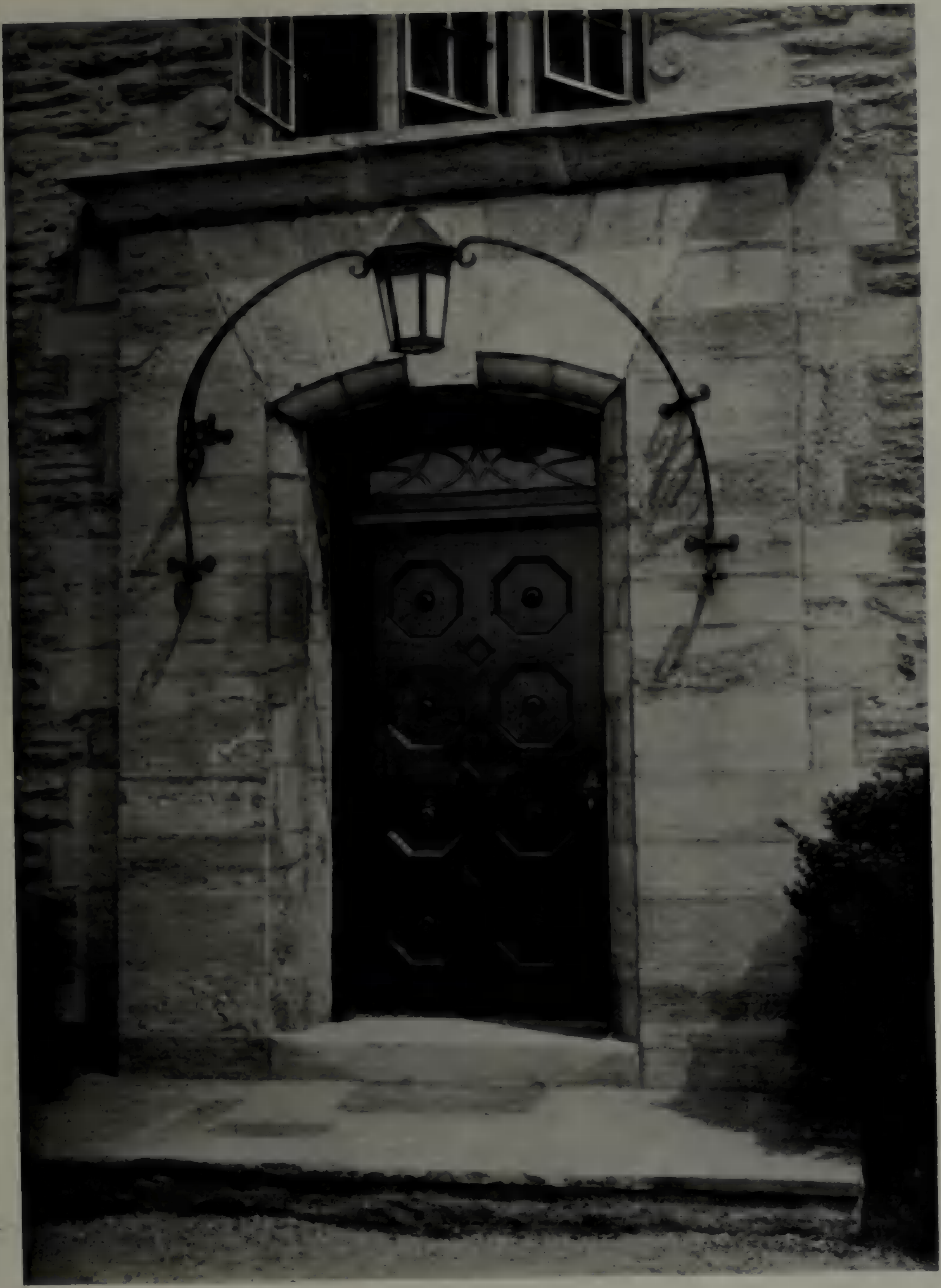
Chimneys: local stone with diaper pattern of brick work.

Windows: steel casement.

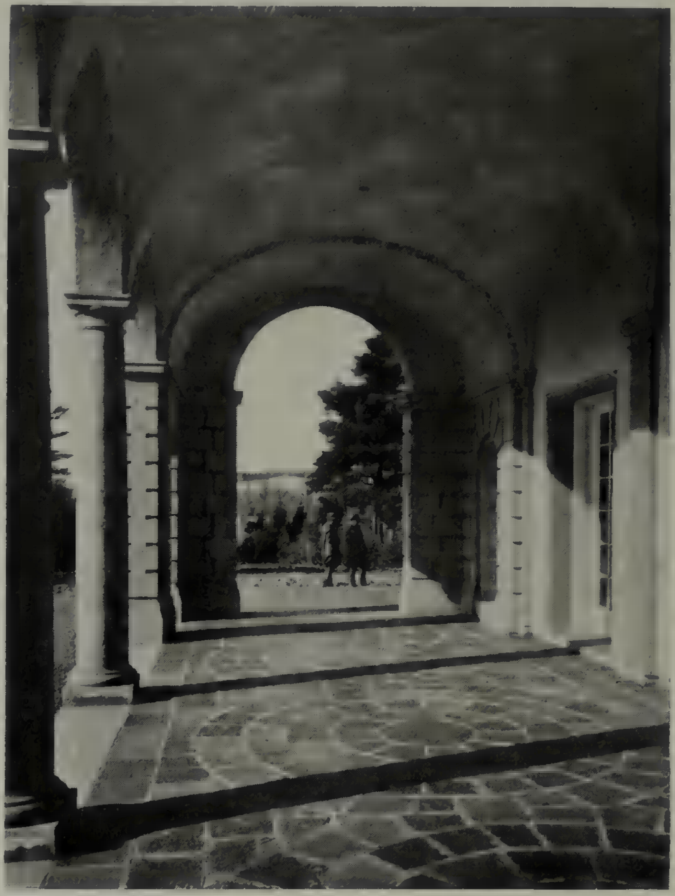
Walls: local stone with dressed local stone at front entrance.

Color scheme: stone work slightly rusty in color showing light tones of yellow and brown; windows and frames, painted dark green; front door and frame, oak.

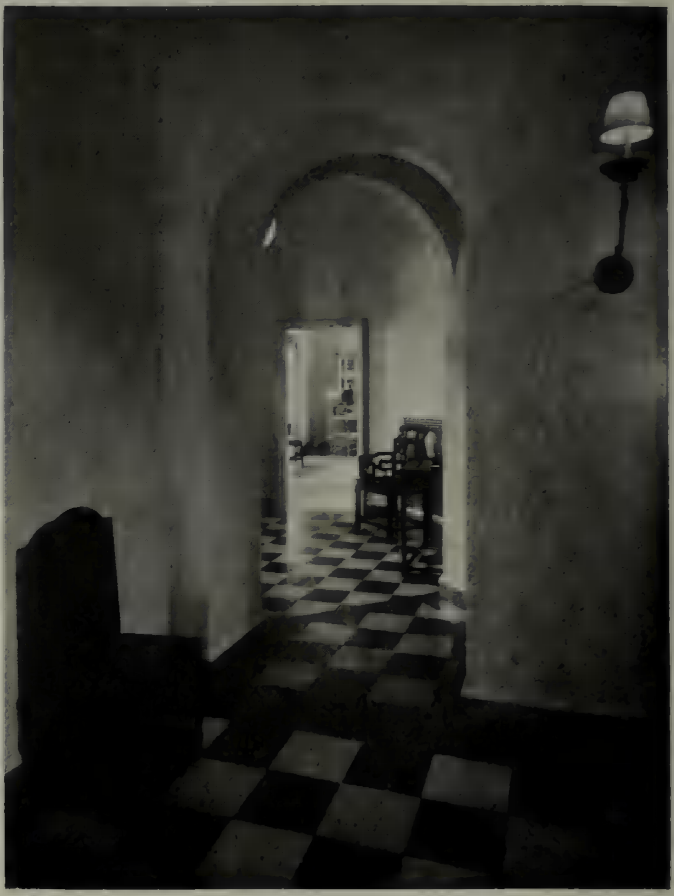
Cost per cu. ft.: approximately 55c.



HOUSE OF MRS. JOHN D. NEWBOLD, JR.
CHESTNUT HILL, PA.
EDWARDS AND HOFFMAN, ARCHITECTS

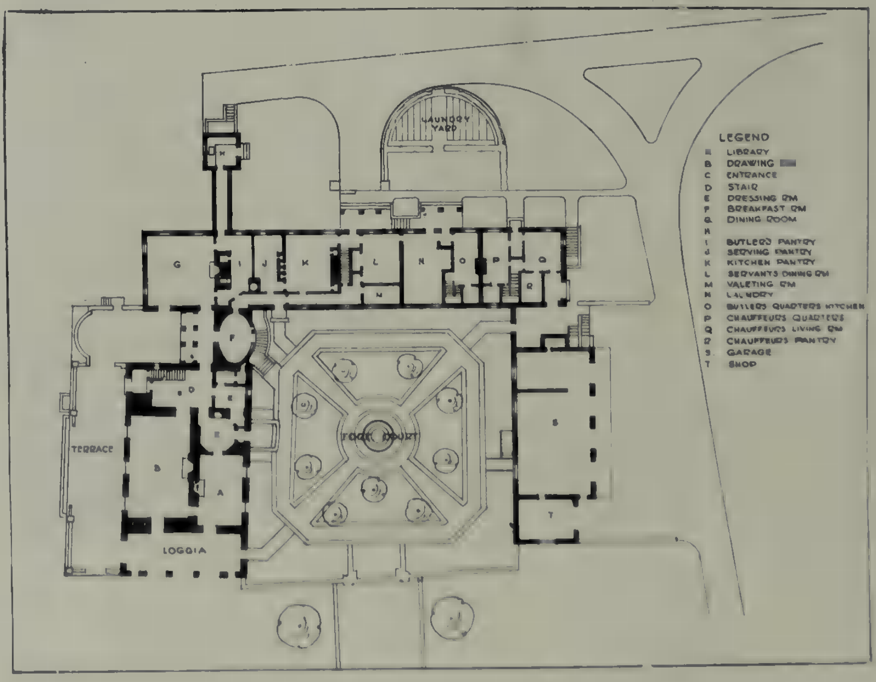


Weber



Weber

HOUSE OF RUSSELL TYSON
NORTH ANDOVER, MASS.
PERRY, SHAW AND HEPBURN, ARCHITECTS
FLETCHER STEELE, LANDSCAPE ARCHITECT



Site: on a slight rise, surrounded by large trees.

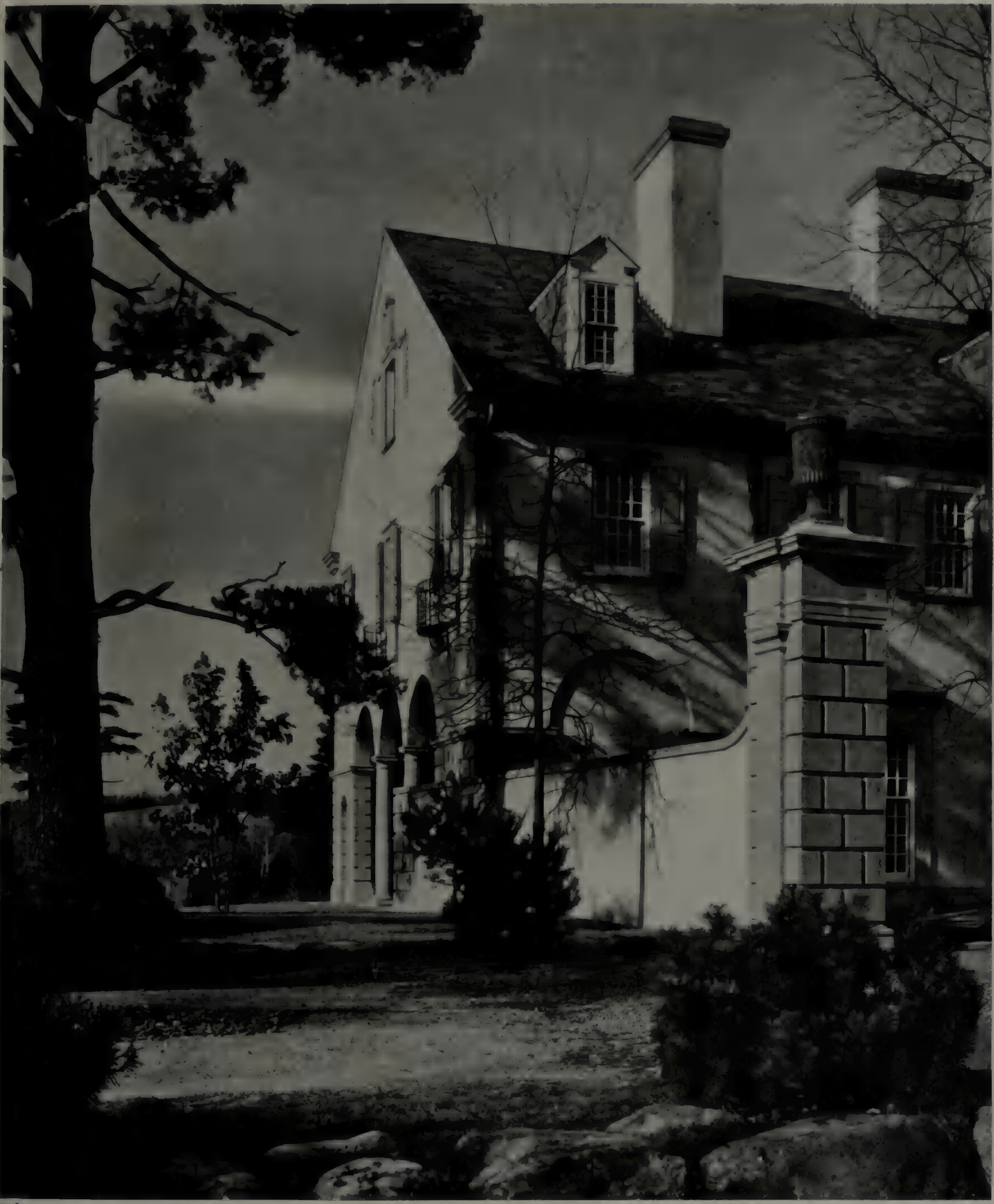
Roof: slate.

Chimneys: stuccoed, stone caps.

Windows: wood.

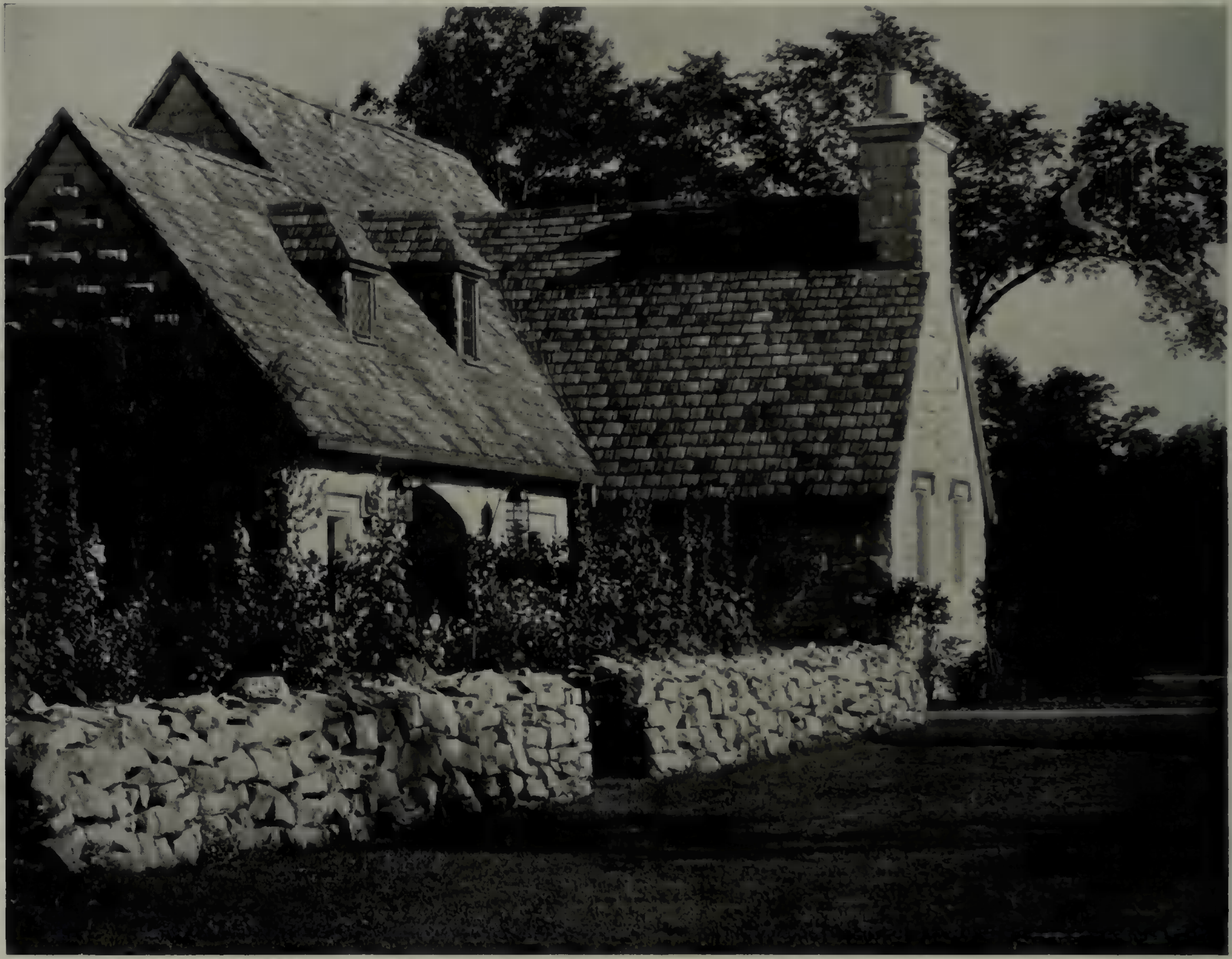
Walls: brick, stuccoed.

Color scheme: pink-gray walls, white woodwork, blue-green shutters.



Weber

HOUSE OF RUSSELL TYSON
NORTH ANDOVER, MASS.
PERRY, SHAW AND HEPBURN, ARCHITECTS



Taylor and Son

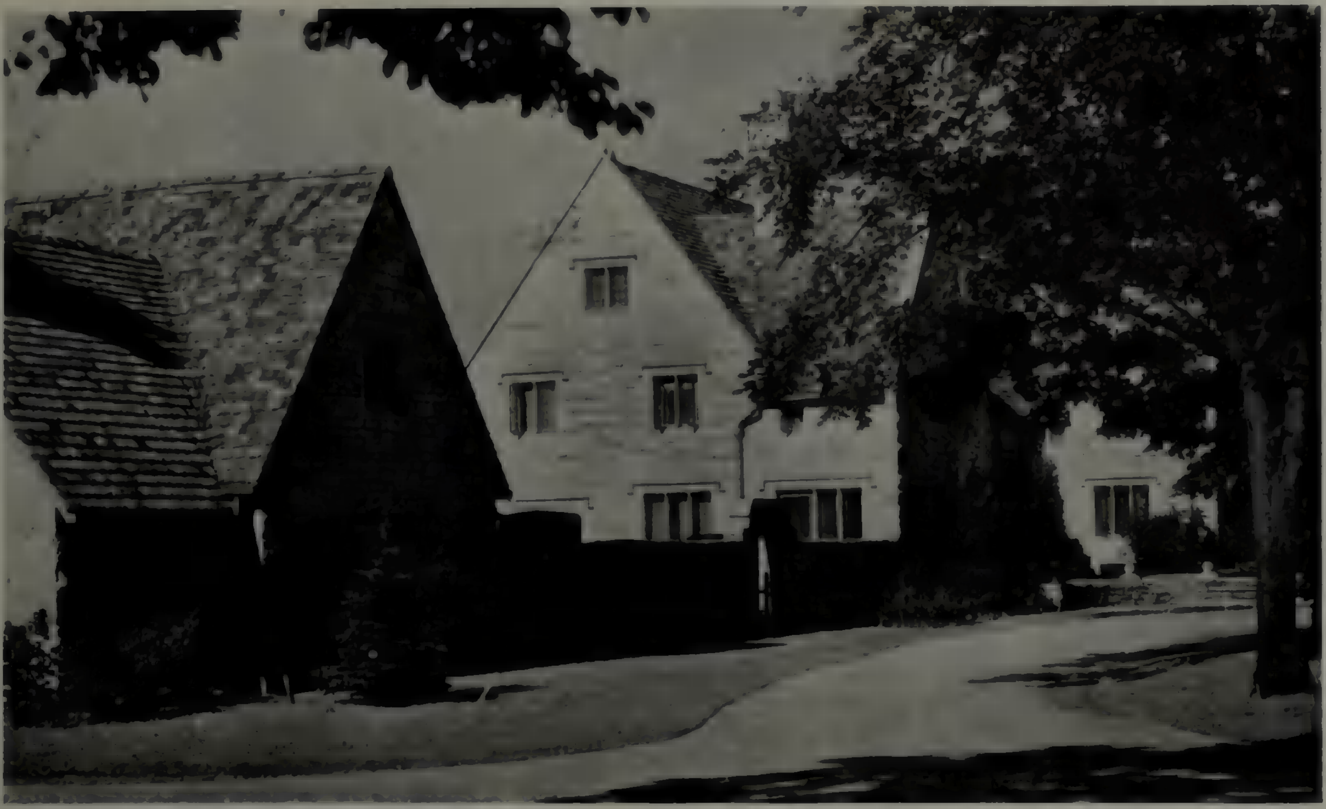
HOUSE OF HAROLD SEAMAN
RIVER HILLS, WISCONSIN
FITZHUGH SCOTT, ARCHITECT

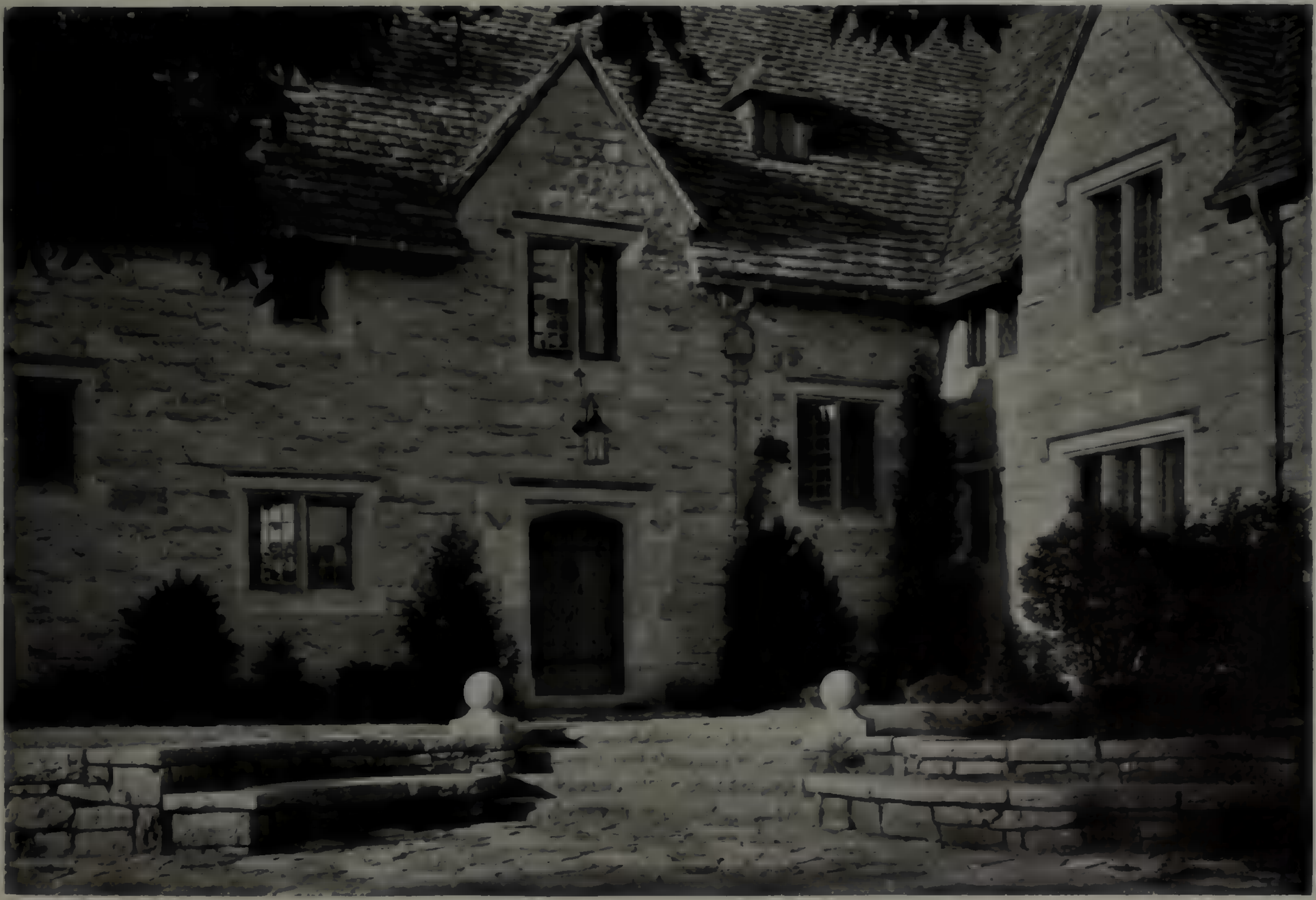
Site: open field rising gradually from banks of Milwaukee River, with a few fine trees and orchard to north. To raise house and overcome possible flood conditions, entance was terraced on north side following line of drive; a service court walled in on east and the ground graded to river on west and south.

Construction: Cincrete and tile joists for floor; stone and Cincrete blocks for all walls. Lime stone from Madison, Wisconsin; a warm yellow, in blocks of varying size.

Windows: steel casements opening out, screened with roll screens and glazed with leaded plate glass and occasional antique panes.

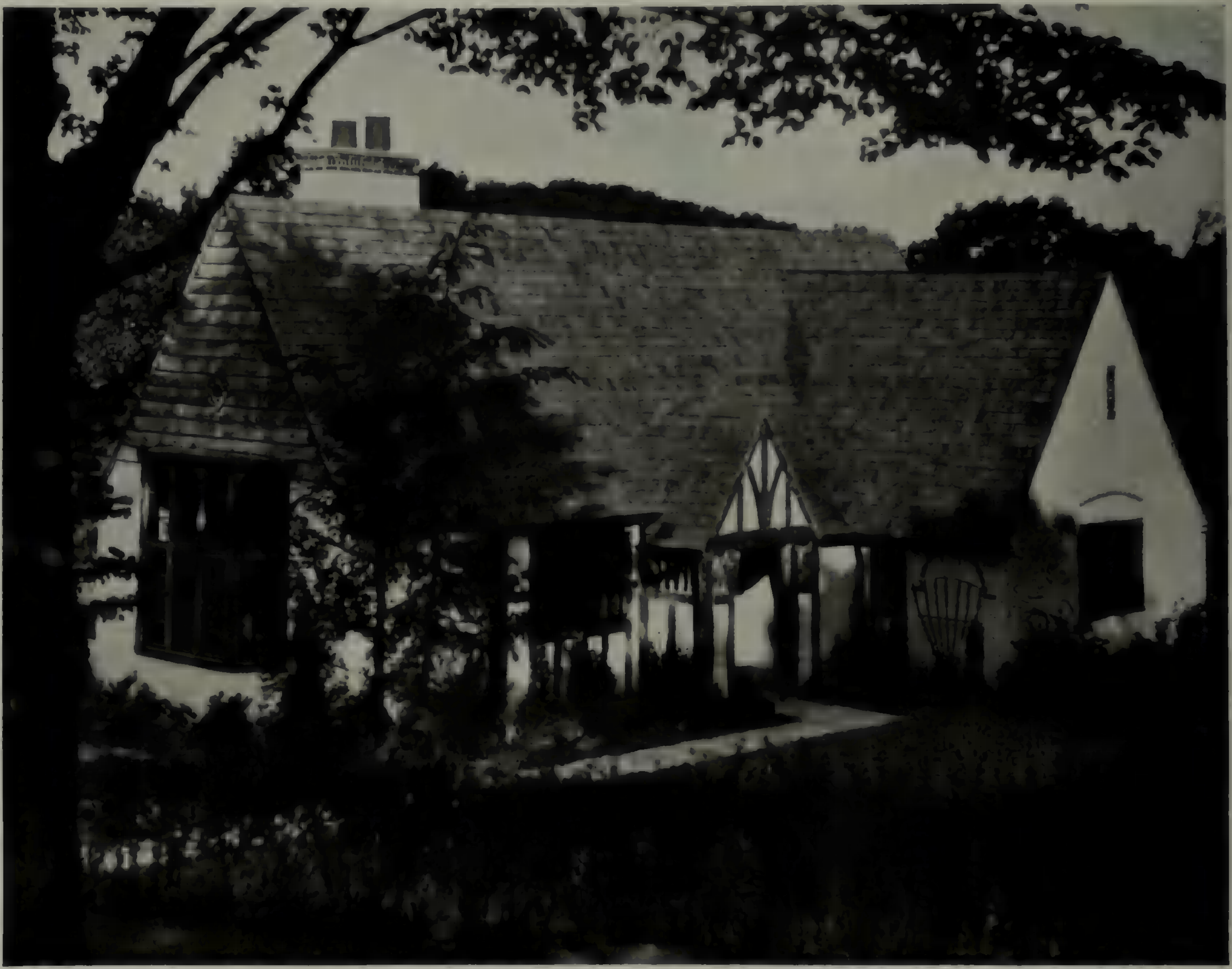
Roof: handmade Yale Memorial slate tile of large size, rough texture, a soft dark bluish gray. Tile ridge, lead flashing. Gutters, leaders and leader heads of cast lead.





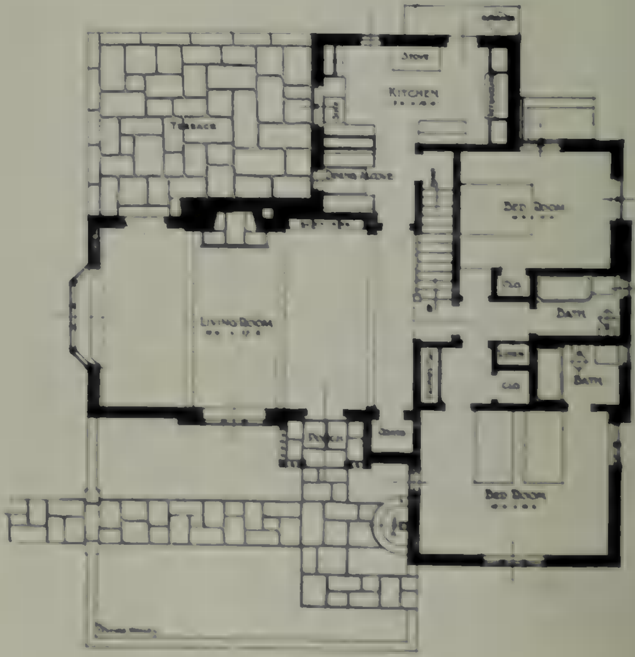
Taylor and Son

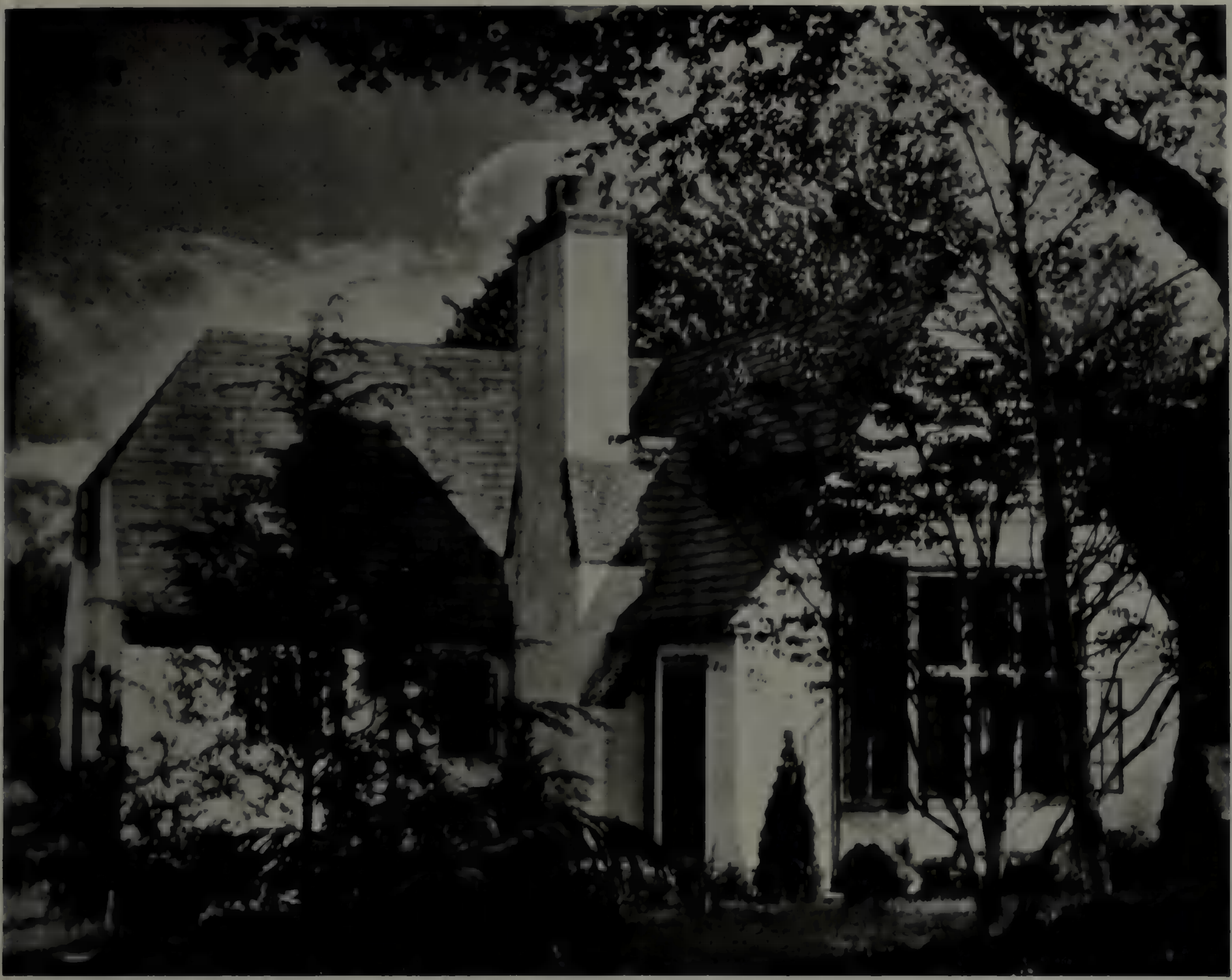
HOUSE OF HAROLD SEAMAN
RIVER HILLS, WISCONSIN
FITZHUGH SCOTT, ARCHITECT



Rittase

HOUSE OF MRS. EMMA ASPLUNDH
BRYN ATHYN, PA.
HAROLD THORP CARSWELL, ARCHITECT





Rittase

HOUSE OF MRS. EMMA ASPLUNDH
BRYN ATHYN, PA.
HAROLD THORP CARSWELL, ARCHITECT

Site: a lot 75′ x 150′ with the narrow side fronting south; about 5′ below sidewalk level; prevailing breeze from the southwest.

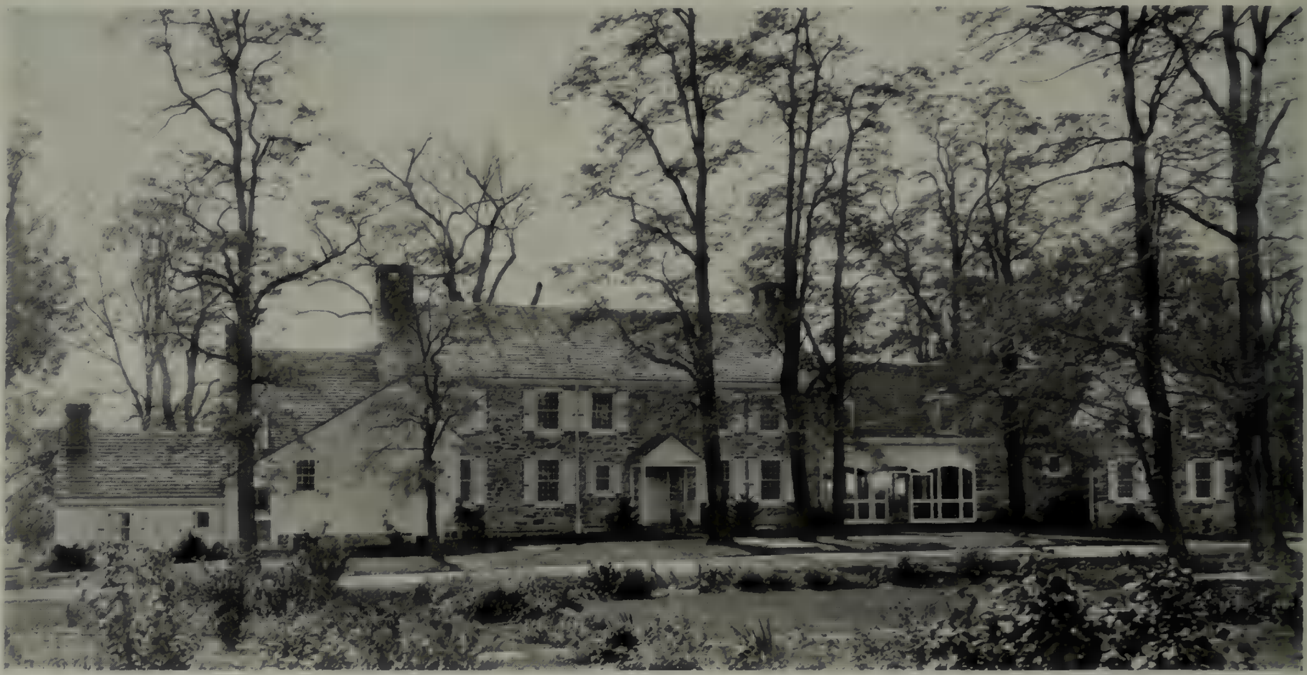
Roof: cedar shingles left to weather, slightly rounded valleys.

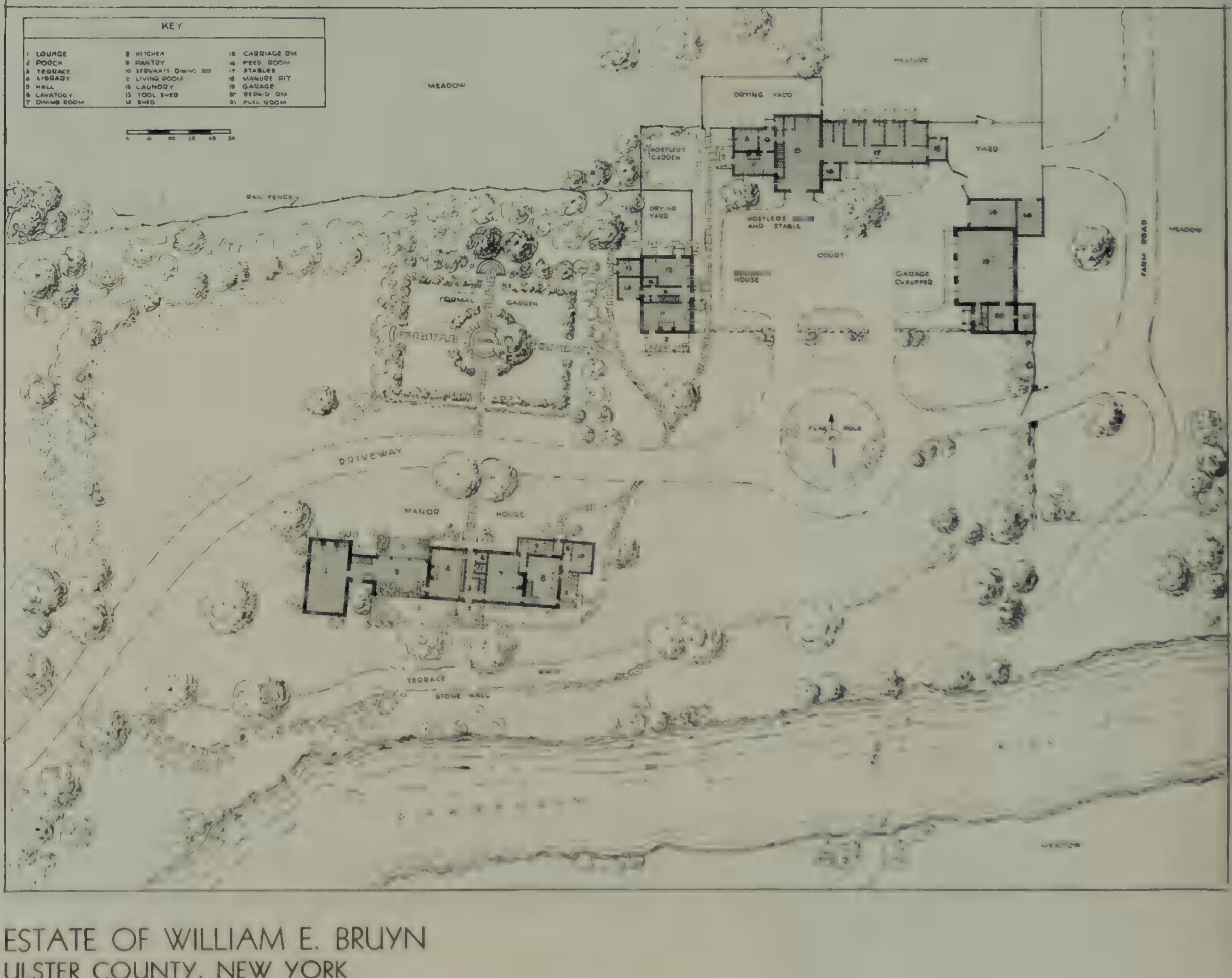
Windows: casement sash.

Walls: hollow stone concrete blocks with common brick for label courses over the windows and for chimney offsets.

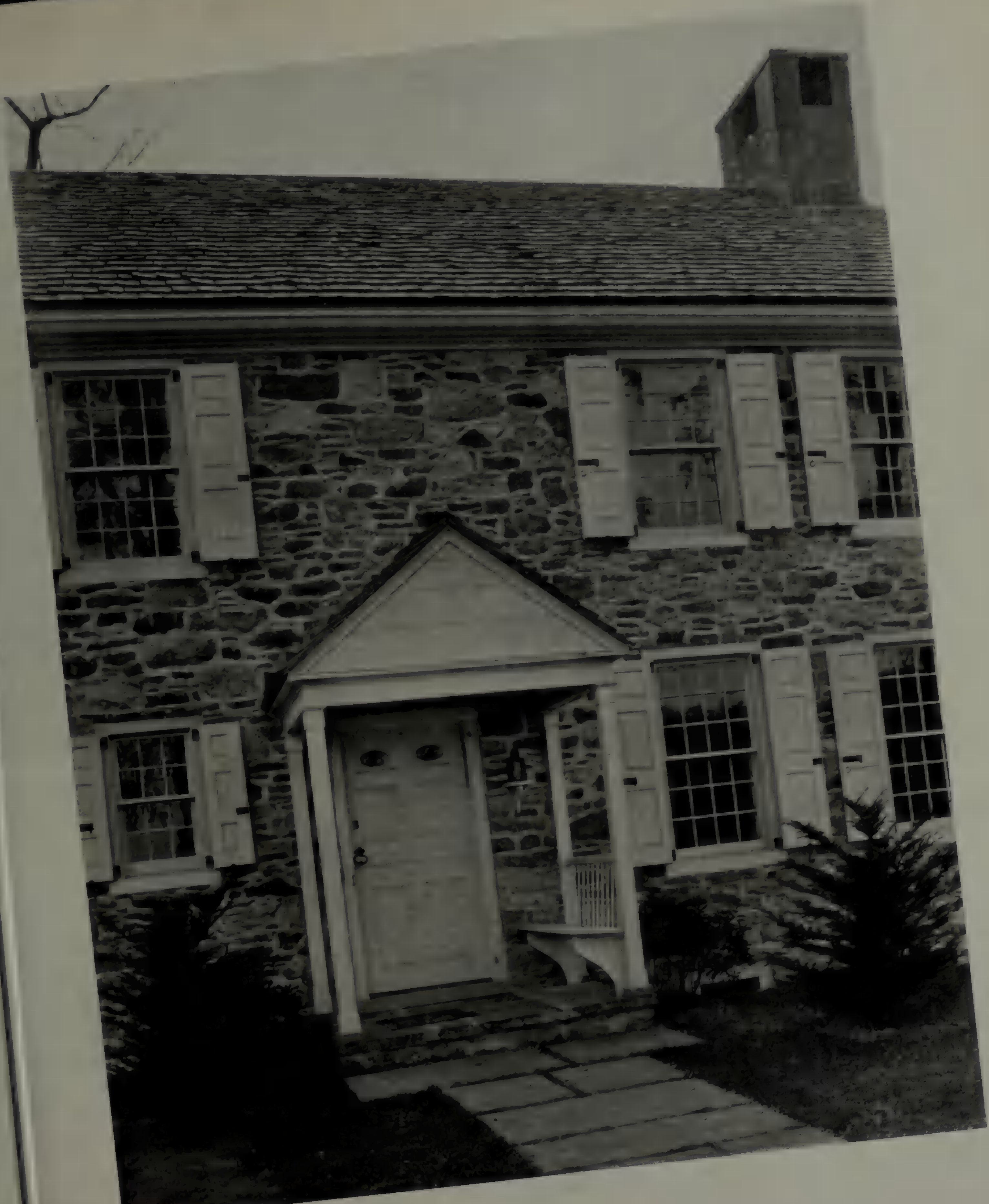
Color scheme: all masonry painted cream-white and brickwork wiped before taking set; woodwork stained creosote, whitewashed, and wiped after twenty-four hours, producing a soft gray with whitewash filling the pores of the wood; casements painted dark green.

Cost per cu. ft.: 52c.

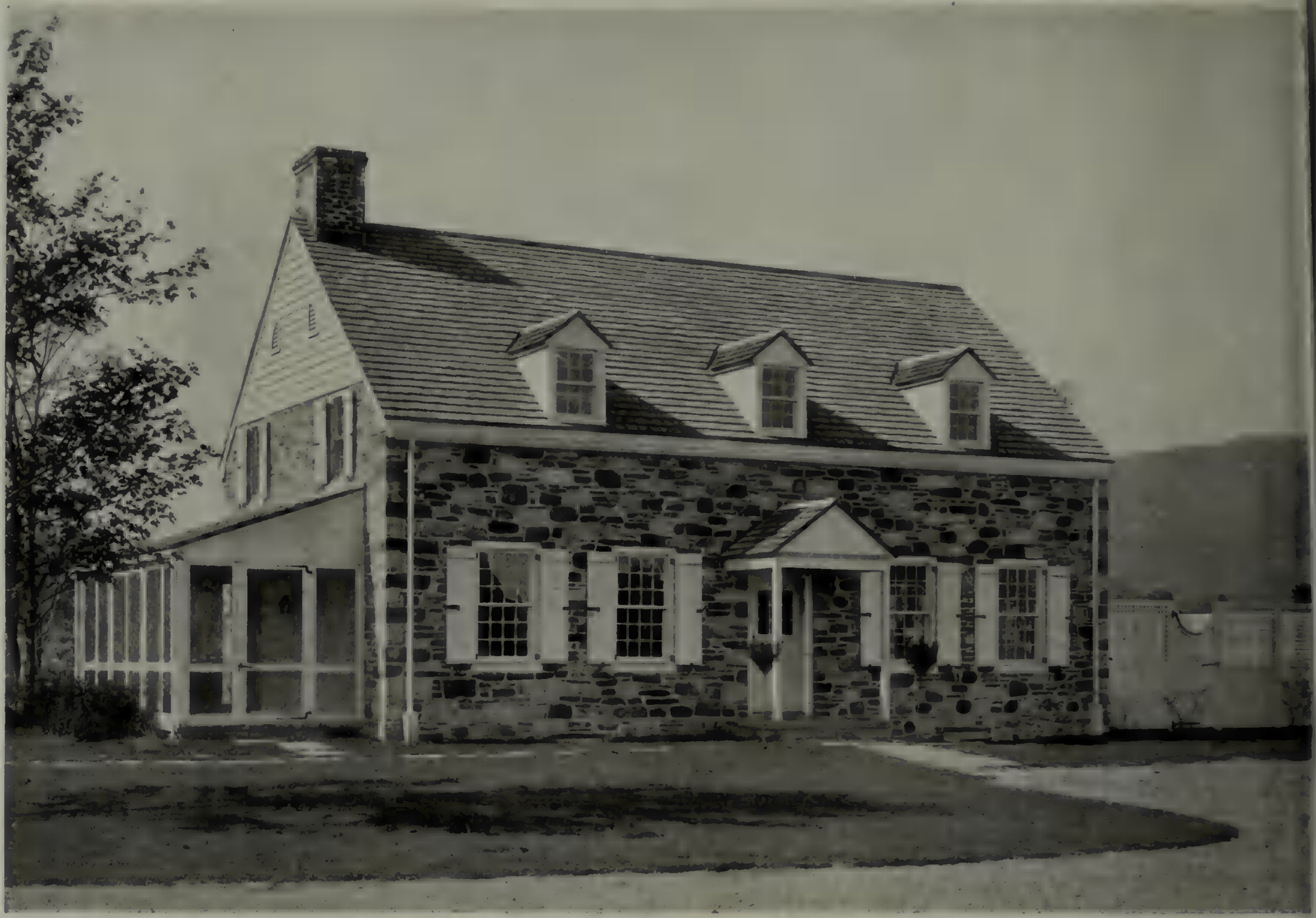




ESTATE OF WILLIAM E. BRUYN
ULSTER COUNTY, NEW YORK
TELLER AND HALVERSON, ARCHITECTS



HOUSE OF WILLIAM E. BRUYN
ULSTER COUNTY, NEW YORK
TELLER AND HALVERSON, ARCHITECTS



ESTATE OF WILLIAM E. BRUYN
ULSTER COUNTY, NEW YORK
TELLER AND HALVERSON, ARCHITECTS

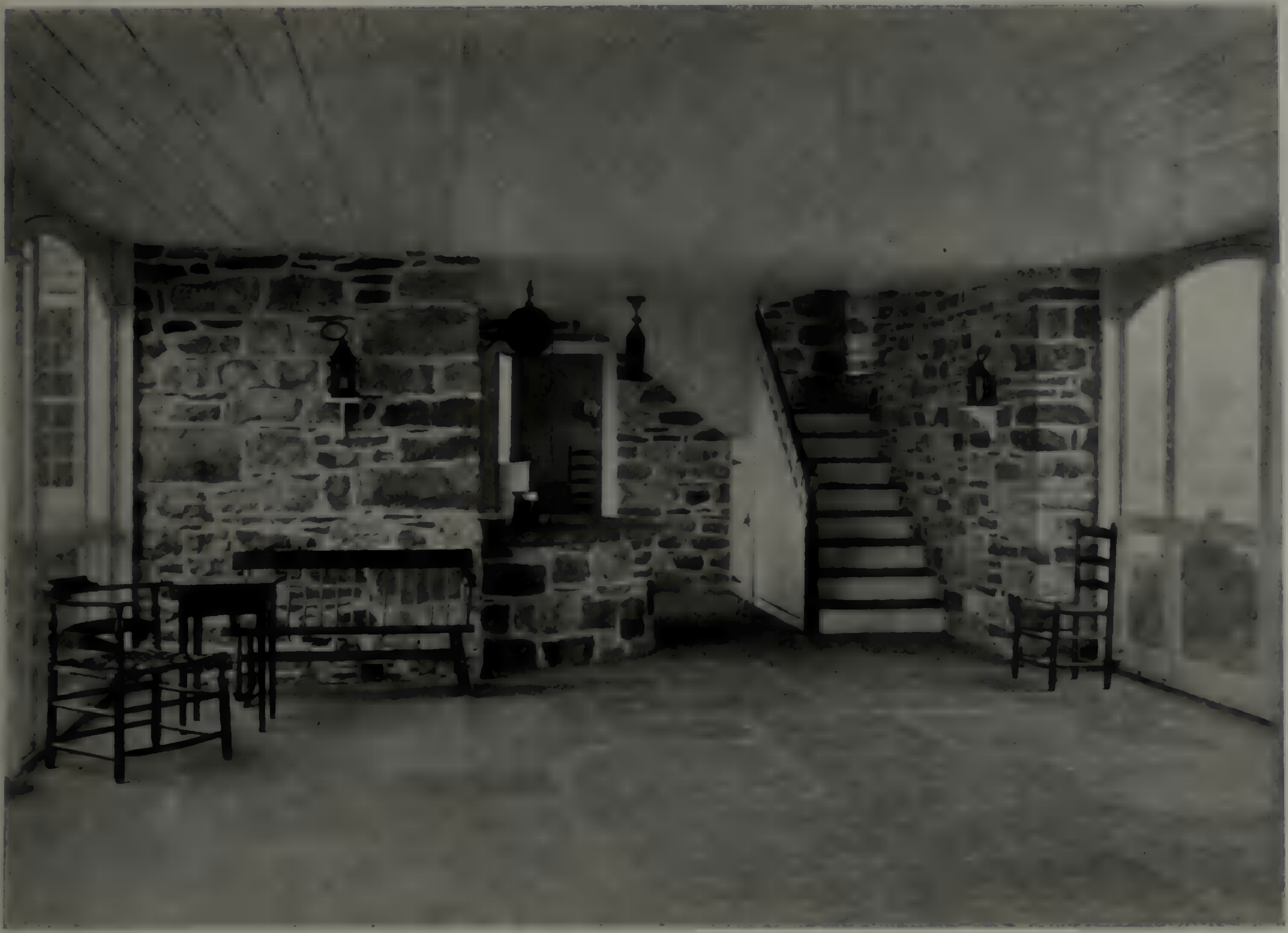
Servants' Cottage.

Site: on the banks of the Shawangunk Creek.

Problem: the house was a low rambling Dutch Colonial stone house, dating back in the Bruyn family records to 1694, and to make a summer home, the owner desired to restore the old house, enlarging a part by raising it to two stories and adding a wing for the accommodation of guests. This required leveling to the ground all but that part of the old house still occupied, as the kitchen.

Walls: stone to match that of old house left standing, reusing old stone from walls torn down and adding new from the same local source that supplied the original builders.

Floors: wide oak boards of varying widths secured with hand-headed spikes. In most cases the floor beams of the second story form the ceilings of the rooms below.



HOUSE OF WILLIAM E. BRUYN
ULSTER COUNTY, NEW YORK
TELLER AND HALVERSON, ARCHITECTS

Porch, view toward lounge. Stair leads to guest rooms over lounge room.

Roofs: 24" hand-rived cypress shingles, left to weather.

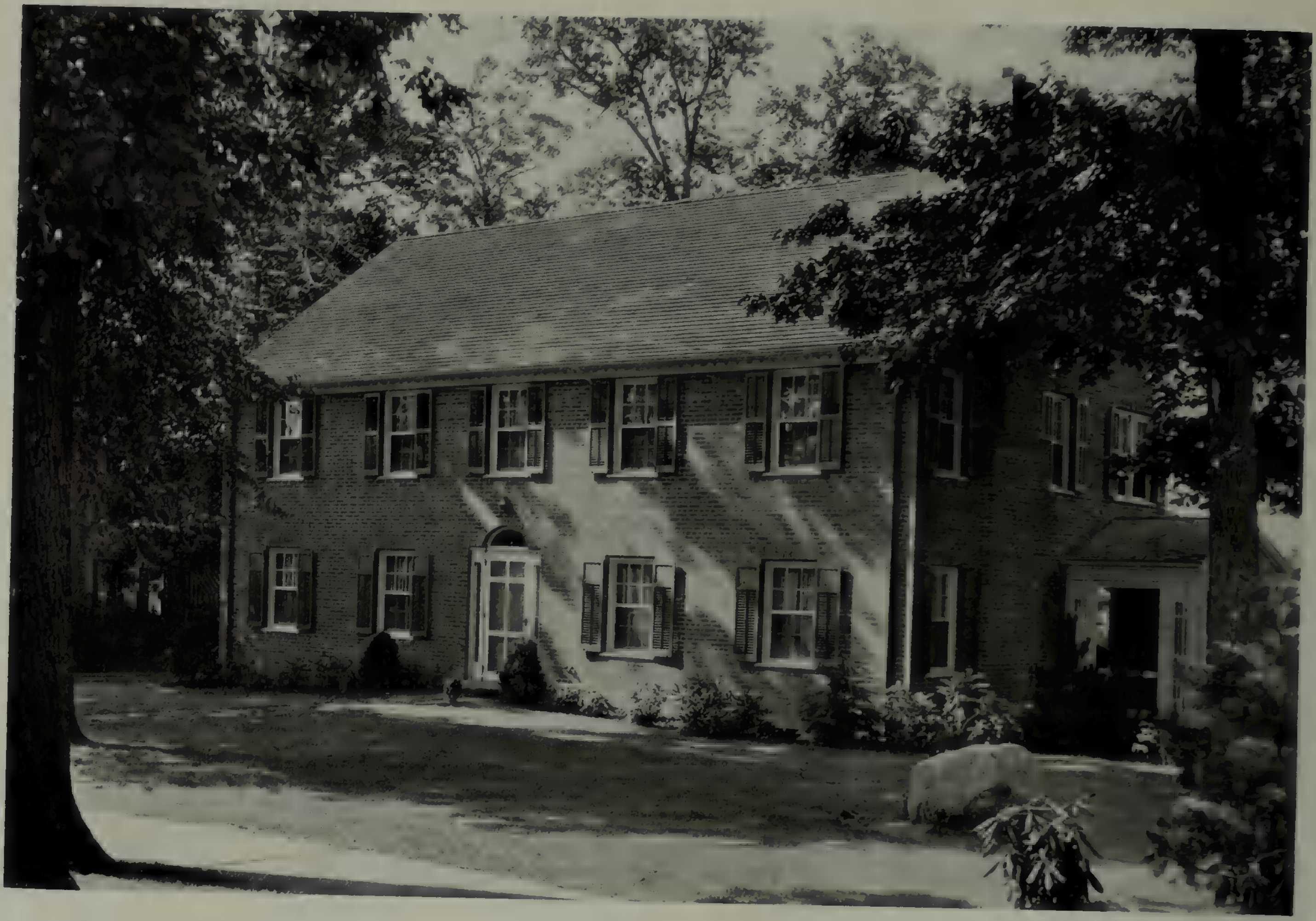
Chimneys: Ulster County brick, capped with native blue stone flag.

Outside trim: wide white pine clapboarding, log gutters.

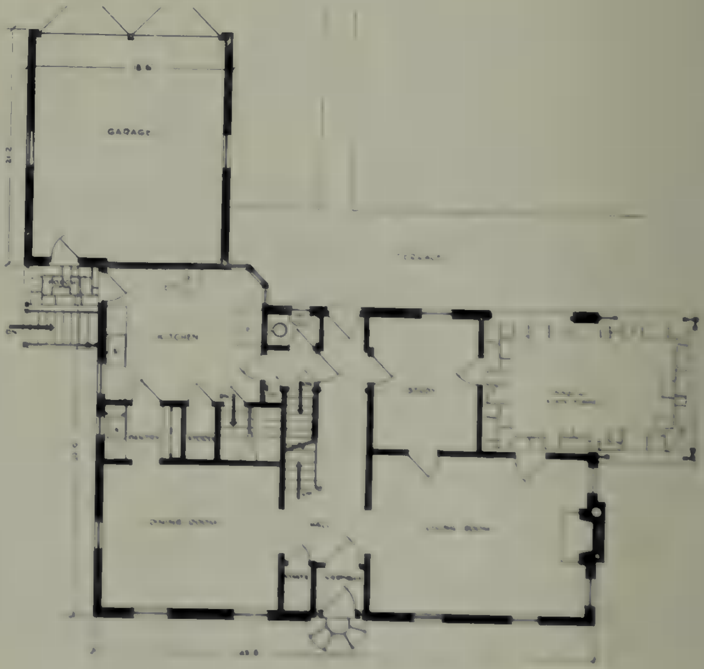
Windows: double-hung sash with small lights, old glass 6" x 8" and 7" x 9"; paneled shutters hung and fitted with hand-forged iron hardware.

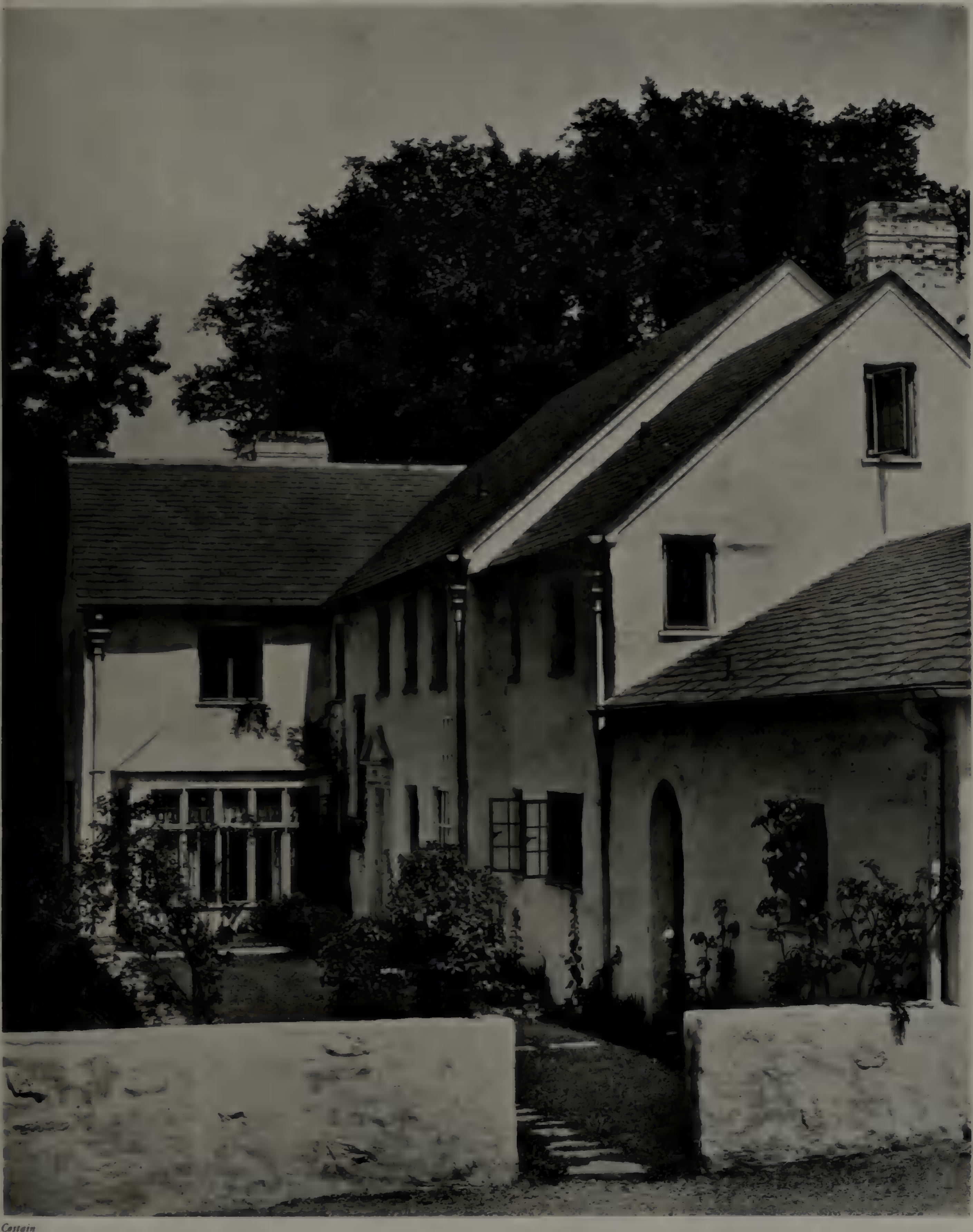
Terraces and porches: native blue stone flag flooring, rectangular in form, laid with broken joints.

Color scheme: walls, gray and pink grit stone with a mingling of blue black and rusty face stone; outside woodwork finished ivory white.



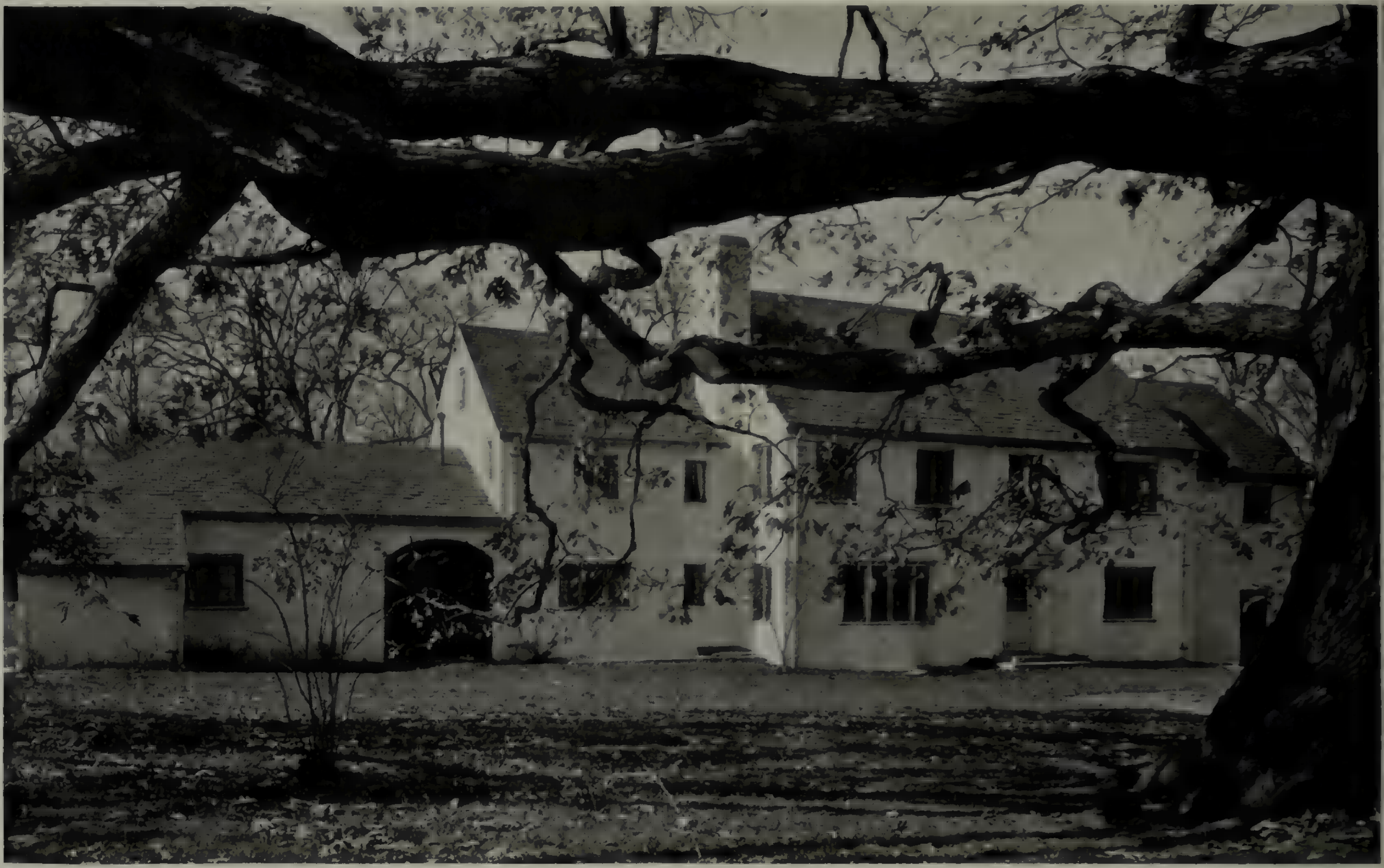
HOUSE OF J. ALLYN OAKLEY
MONTCLAIR, N. J.
DOUGLASS FITCH, ARCHITECT





Costain

HOUSE OF ALAN U. MANN
SCARSDALE, NEW YORK
ELECTUS D. LITCHFIELD, ARCHITECT



Costain

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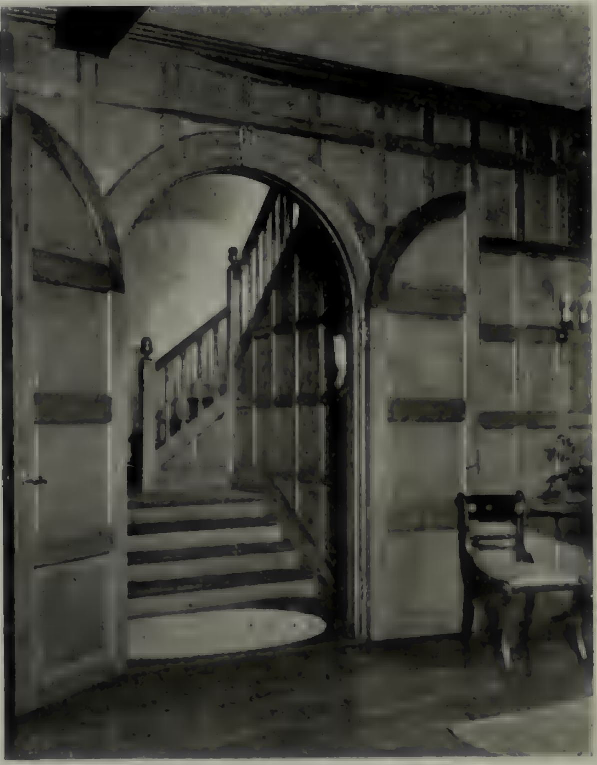
SCARSDALE, NEW YORK
ELECTUS D. LITCHFIELD, ARCHITECT



Site: sloping, bordered by giant oaks.

Construction: "stockade blocks," a patented material, composed of excelsior treated with magnesite and other fireproofing materials, compressed into blocks, which are set with reinforced cores of concrete, and stuccoed, whitewashed or painted.

Roof: graduated black slate.

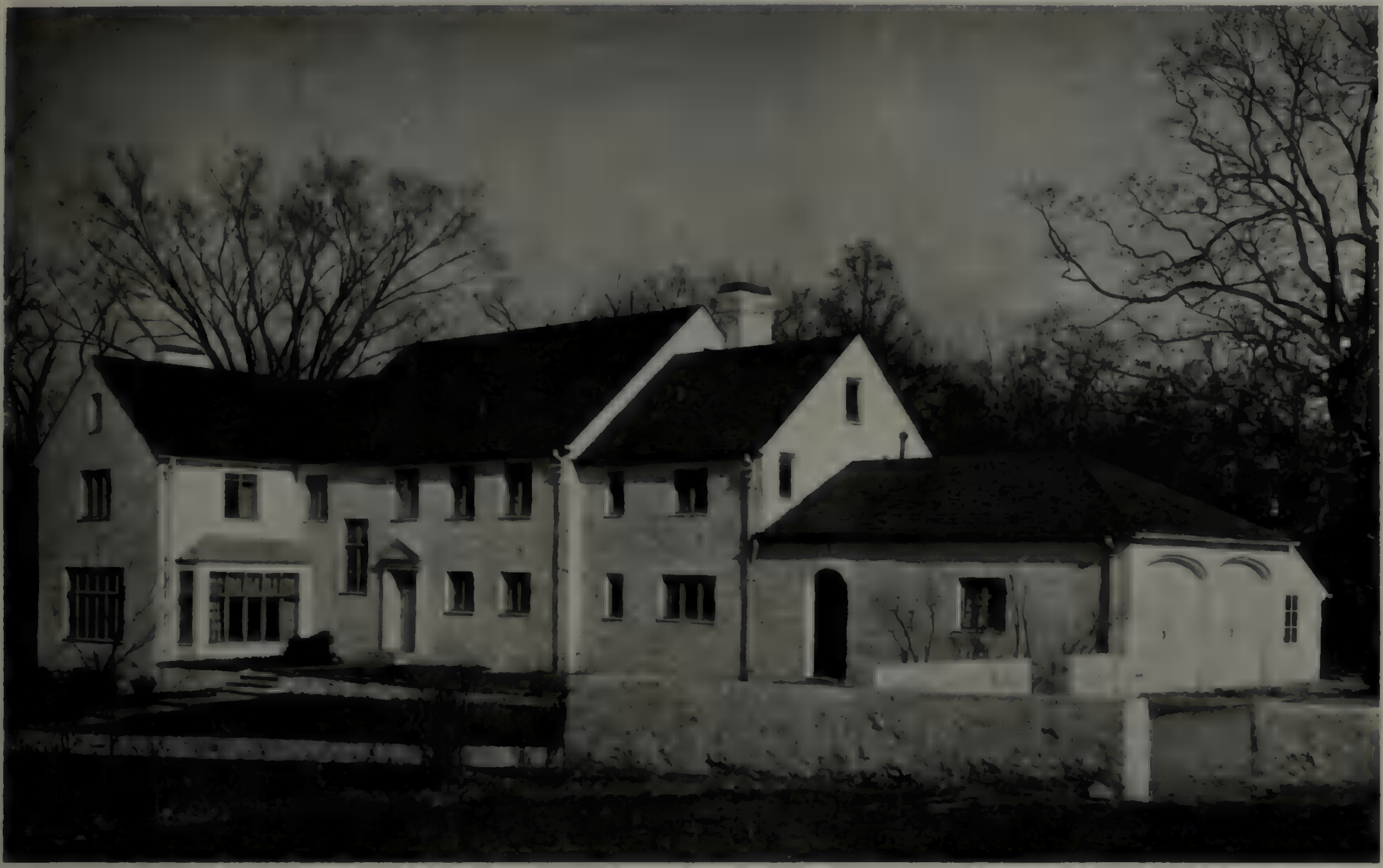
Chimneys: whitewashed brick.

Windows: Crittall steel casement, with rectangular leading, and colored inserts in the stairway windows.

Color: entrance woodwork painted white; window frames a yellow buff.

Interior: pine woodwork in natural color; sand-finished walls slightly stained.

Cost per cu. ft.: 60c.



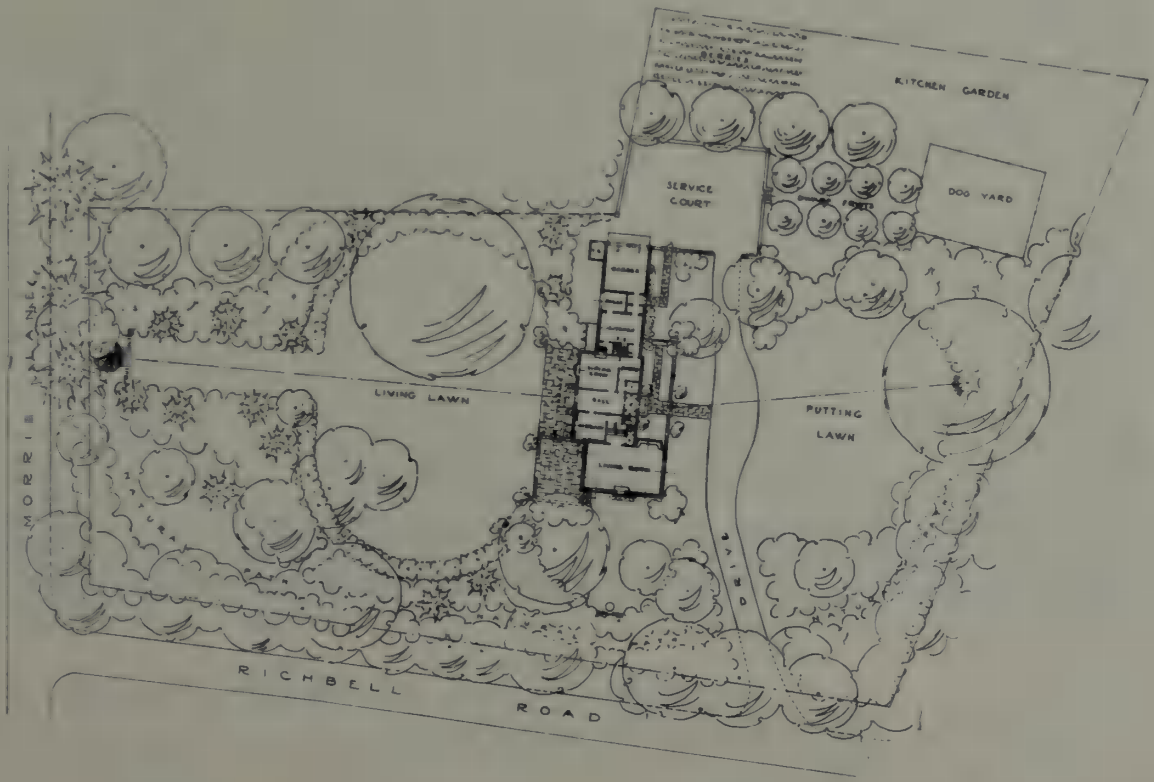
Costain

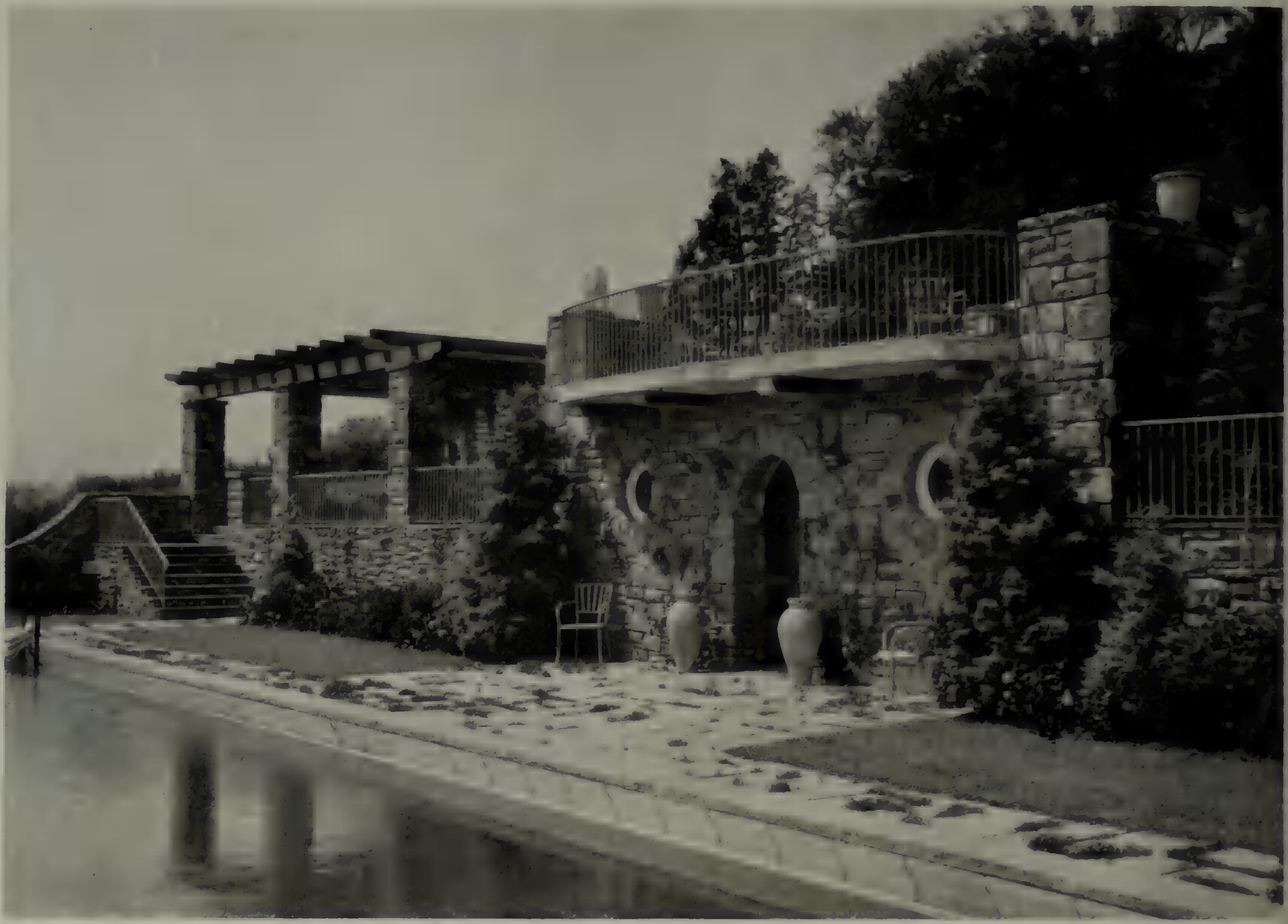
HOUSE OF ALAN U. MANN

SCARSDALE, NEW YORK

ELECTUS D. LITCHFIELD, ARCHITECT

L. HARVEY RUDE, LANDSCAPE ARCHITECT



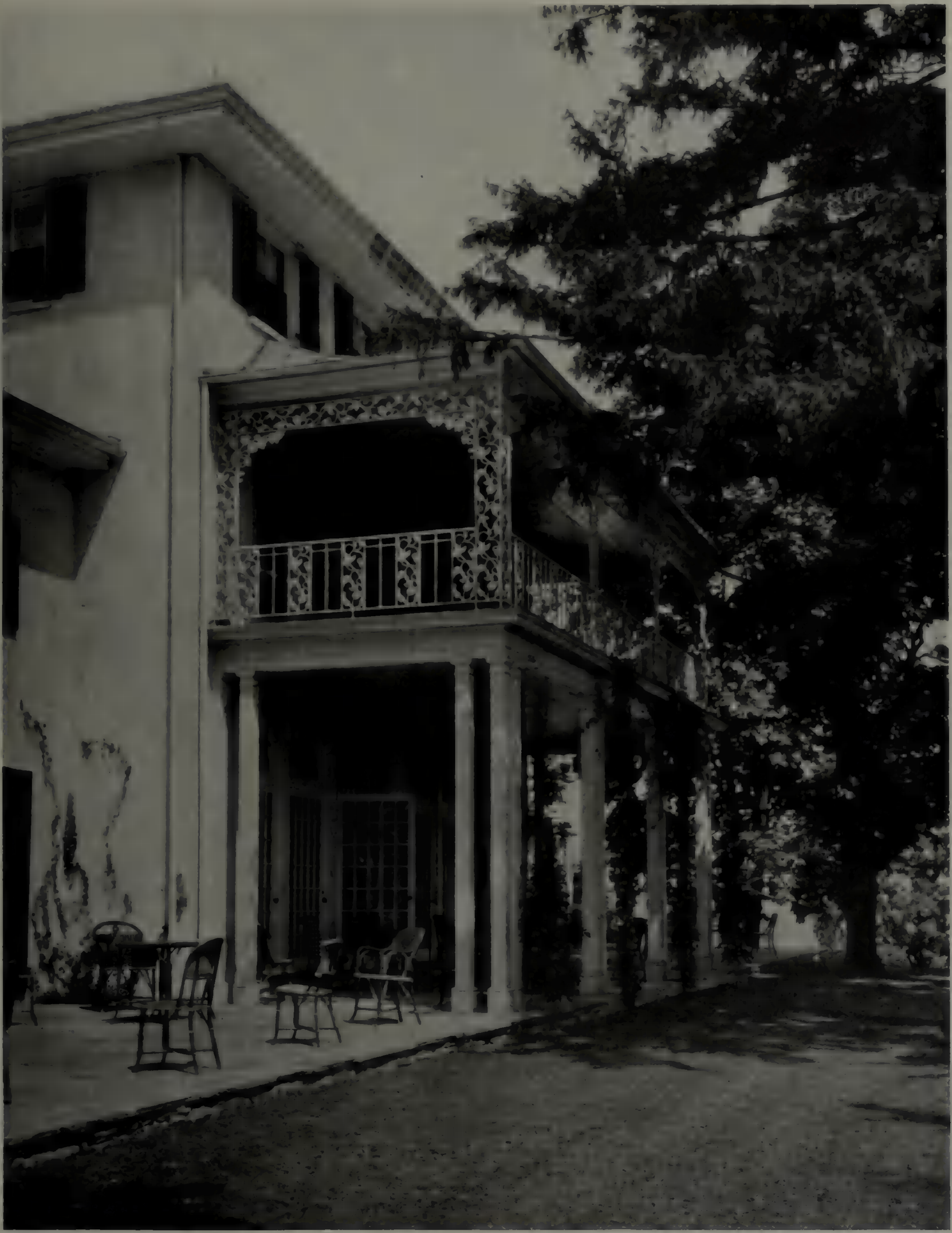


Wallace

ESTATE OF PERCY MILTON CHANDLER
BRANDYWINE LODGE, CHADDSFORD, PA.
RITTER AND SHAY, ARCHITECTS
EXLEY AND KITE, LANDSCAPE DESIGNERS

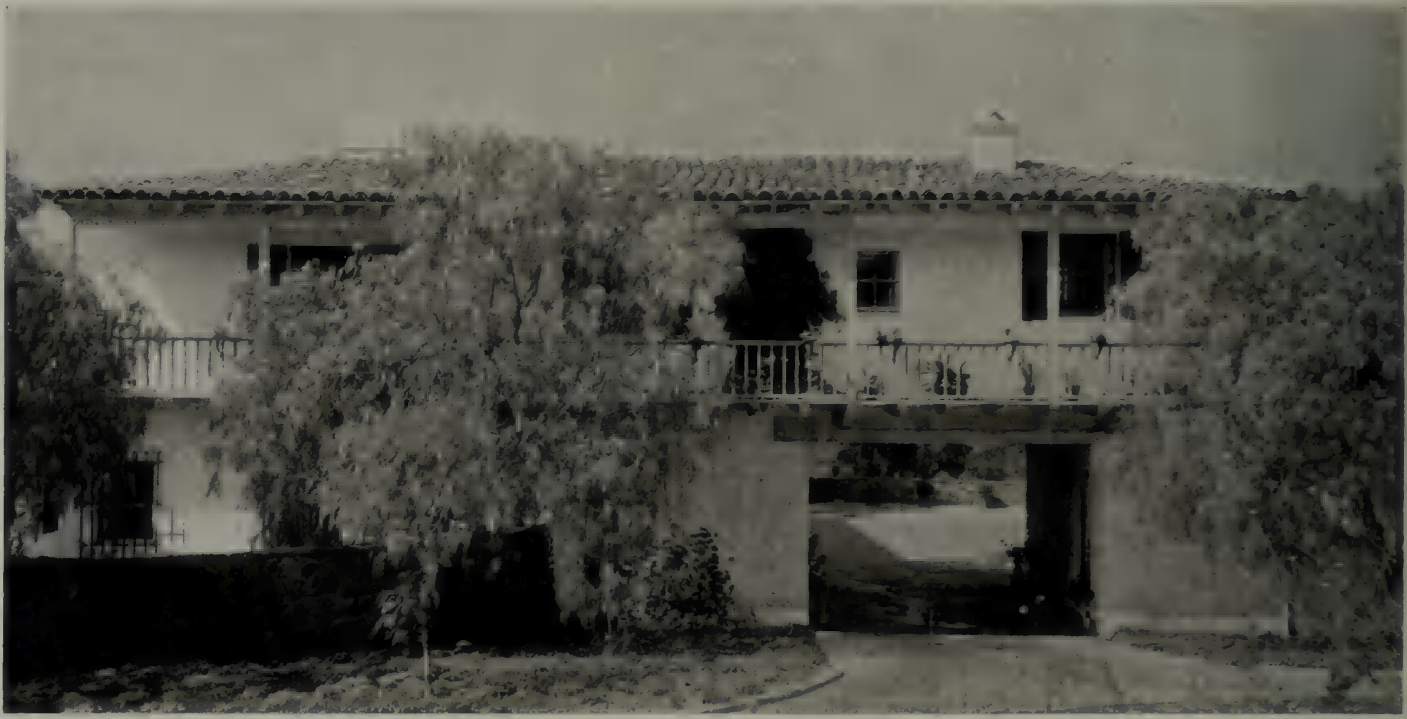
Site: a remodelled farmhouse on the site of the battle of Brandywine. Advantage of the contour of the ground was taken in placing the swimming pool and bath houses on a lower level approached by means of steps and terraces.

Construction: white stucco with dark green shutters and a copper roof; cast iron on upper porches painted white.



Wallace

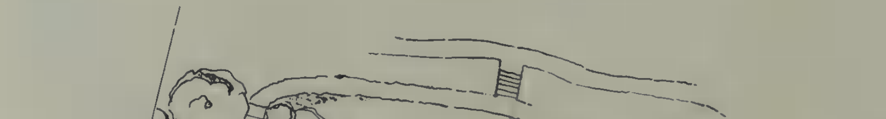
ESTATE OF PERCY MILTON CHANDLER
BRANDYWINE LODGE, CHADDSFORD, PA.
RITTER AND SHAY, ARCHITECTS



Haight

HOUSE OF D. C. NORCROSS

LOS ANGELES
ROLAND E. COATE, ARCHITECT
A. E. HANSON, LANDSCAPE ARCHITECT

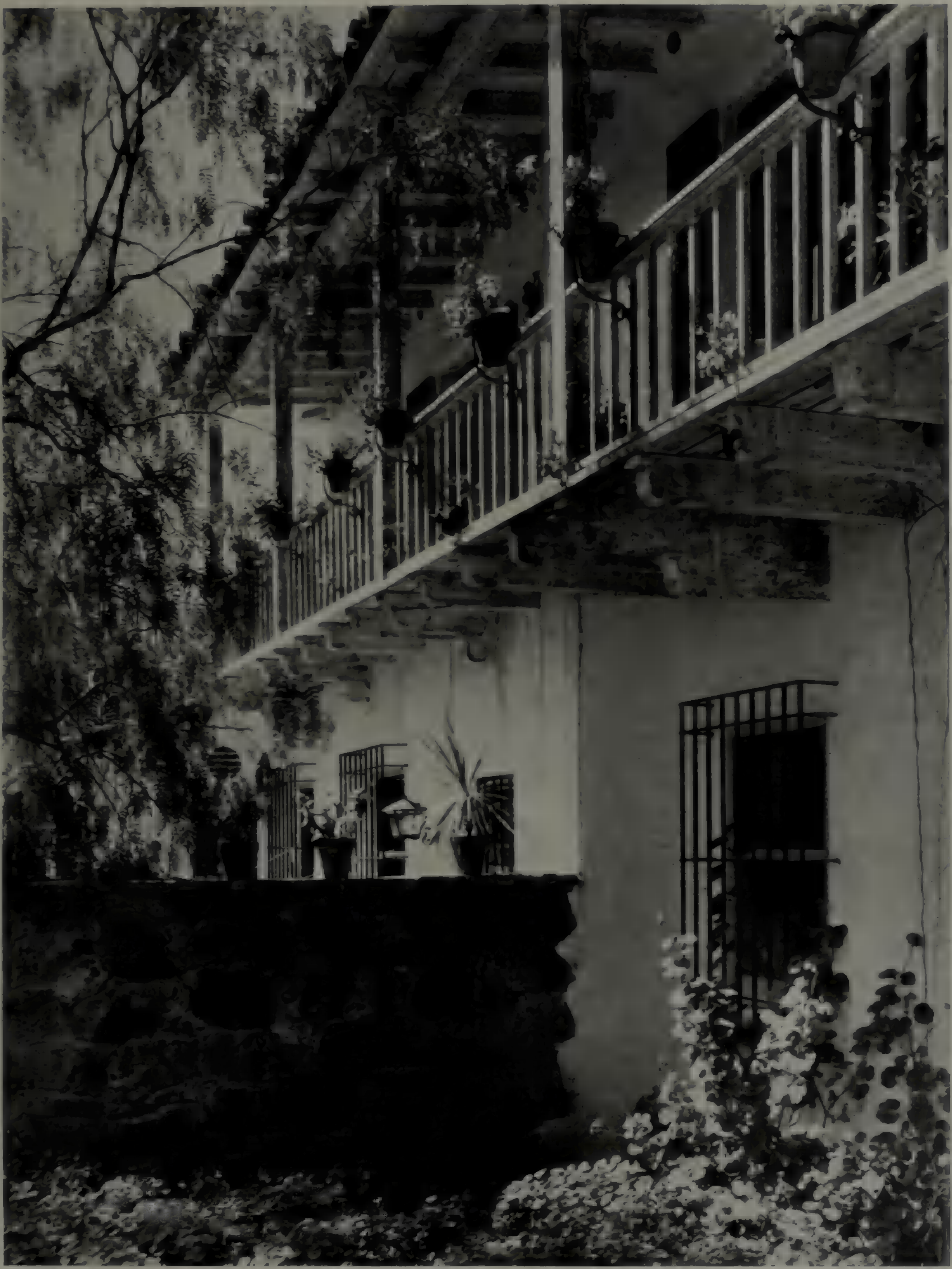


Site: instead of stepping down the various rooms with the grade, ground was excavated so that the house itself rests practically level.

Roof: rough laid hand-made tile, almost yellow in color.

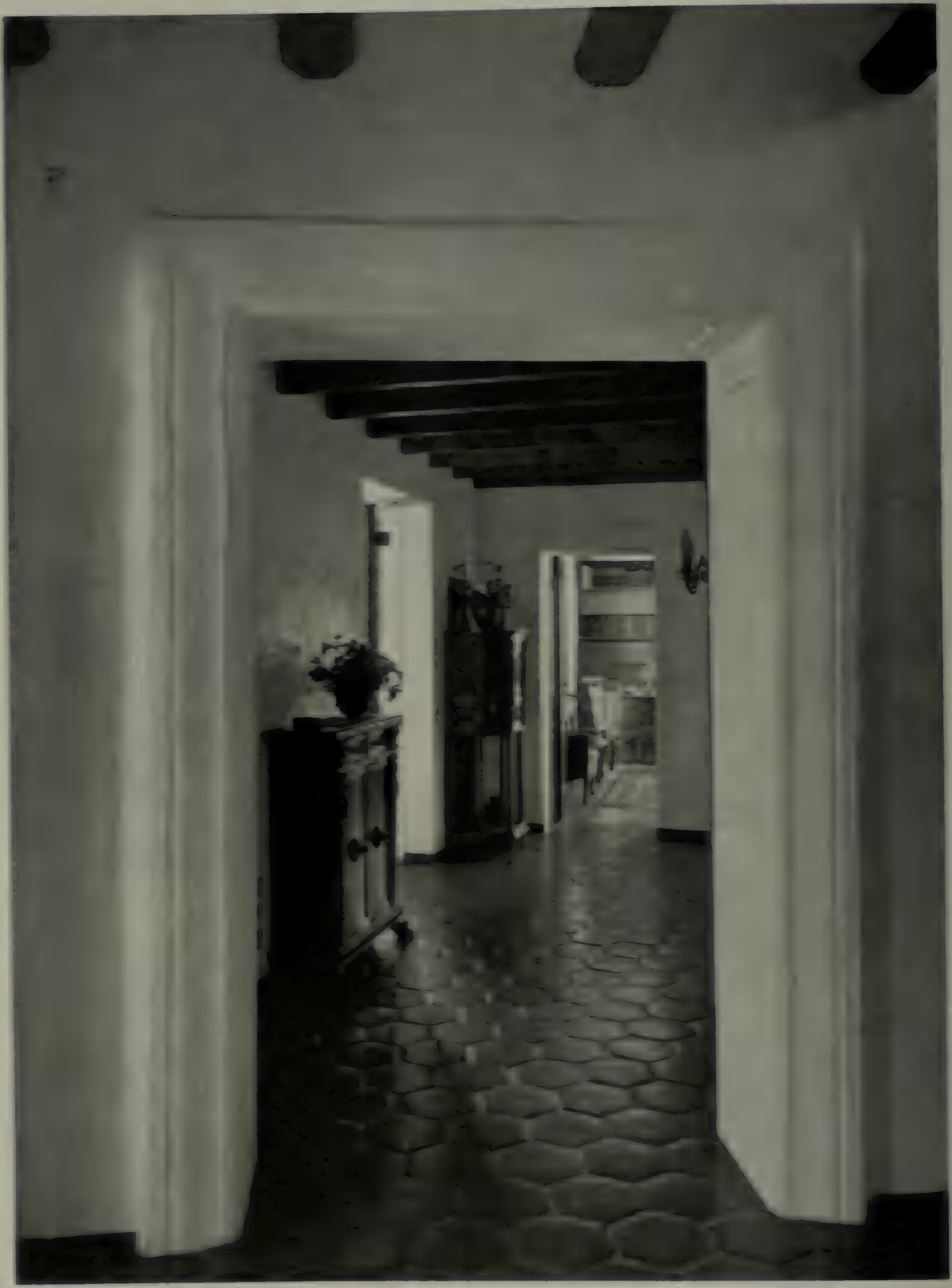
Walls: covered with Gunite which in turn has been given a hand trowelled coat of stucco, resembling old-fashioned lime plaster in texture and color.

Color scheme: walls are pure white. Some windows are painted antique yellow, others green. Shutters are green; likewise the iron work.



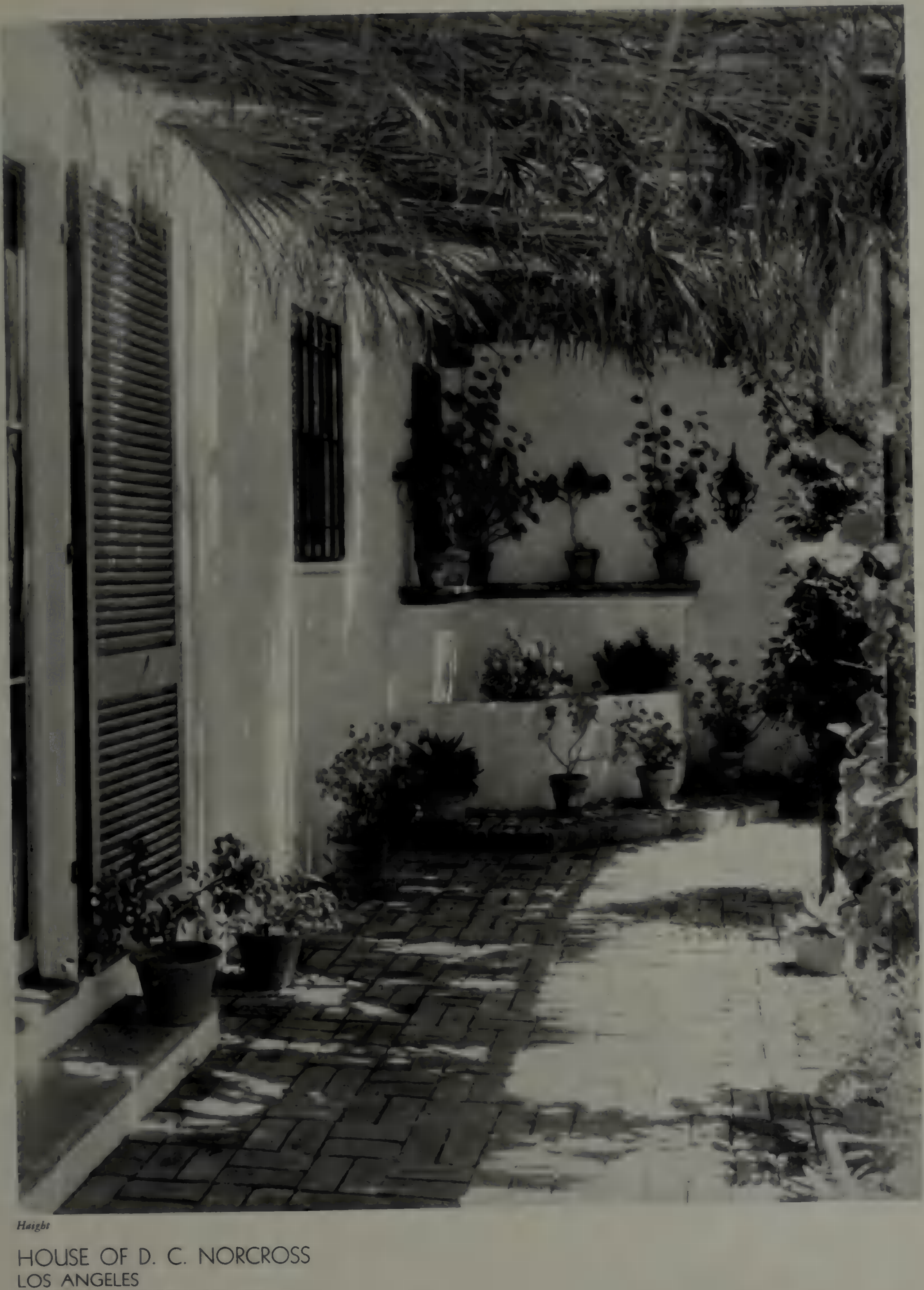
Haight

HOUSE OF D. C. NORCROSS
LOS ANGELES
ROLAND E. COATE, ARCHITECT



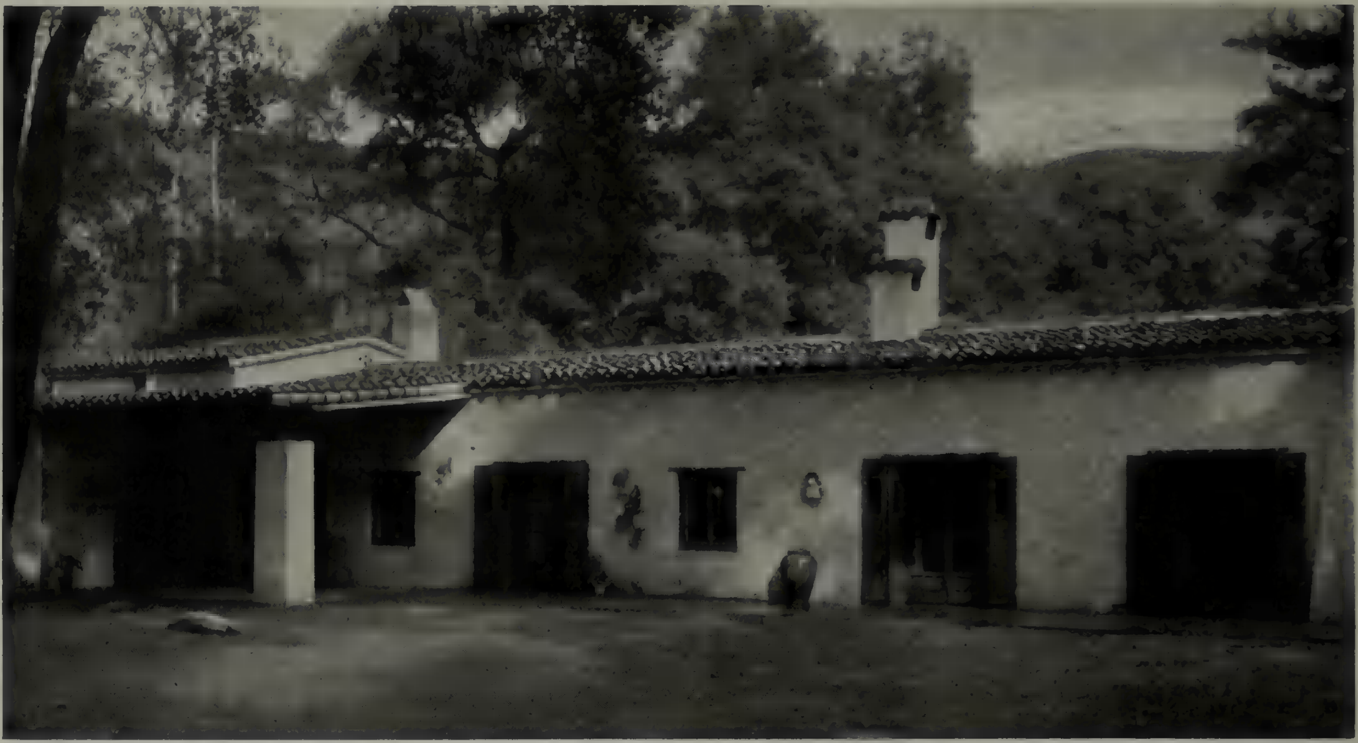
Foyer

HOUSE OF D. C. NORCROSS
LOS ANGELES
ROLAND E. COATE, ARCHITECT



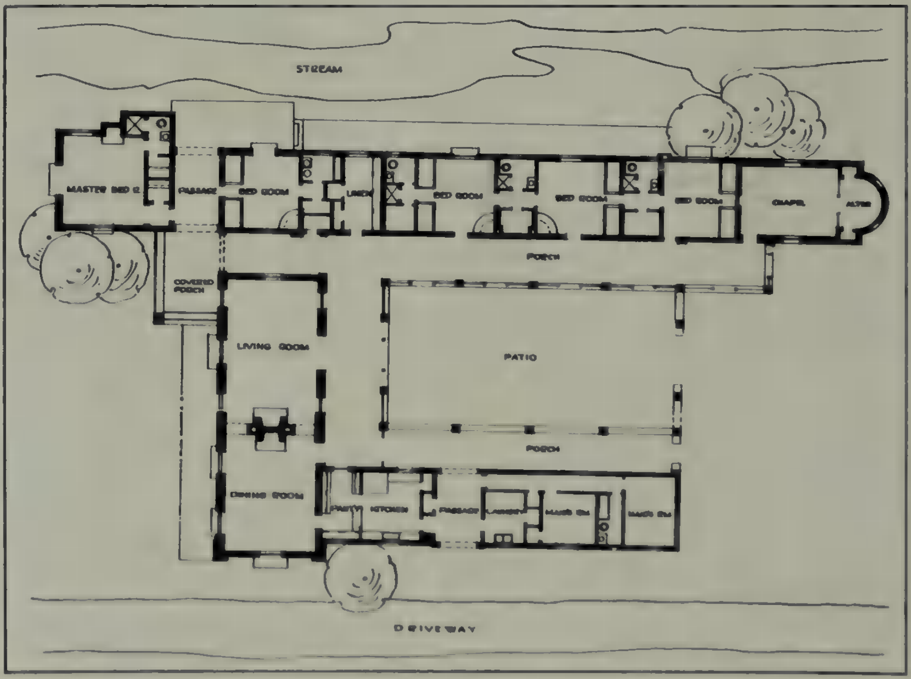
Haight

HOUSE OF D. C. NORCROSS
LOS ANGELES
ROLAND E. COATE, ARCHITECT



Padilla Studios

RANCH HOUSE FOR E. L. DOHENY
SANTA PAULA CANYON, CALIF.
WALLACE NEFF, ARCHITECT



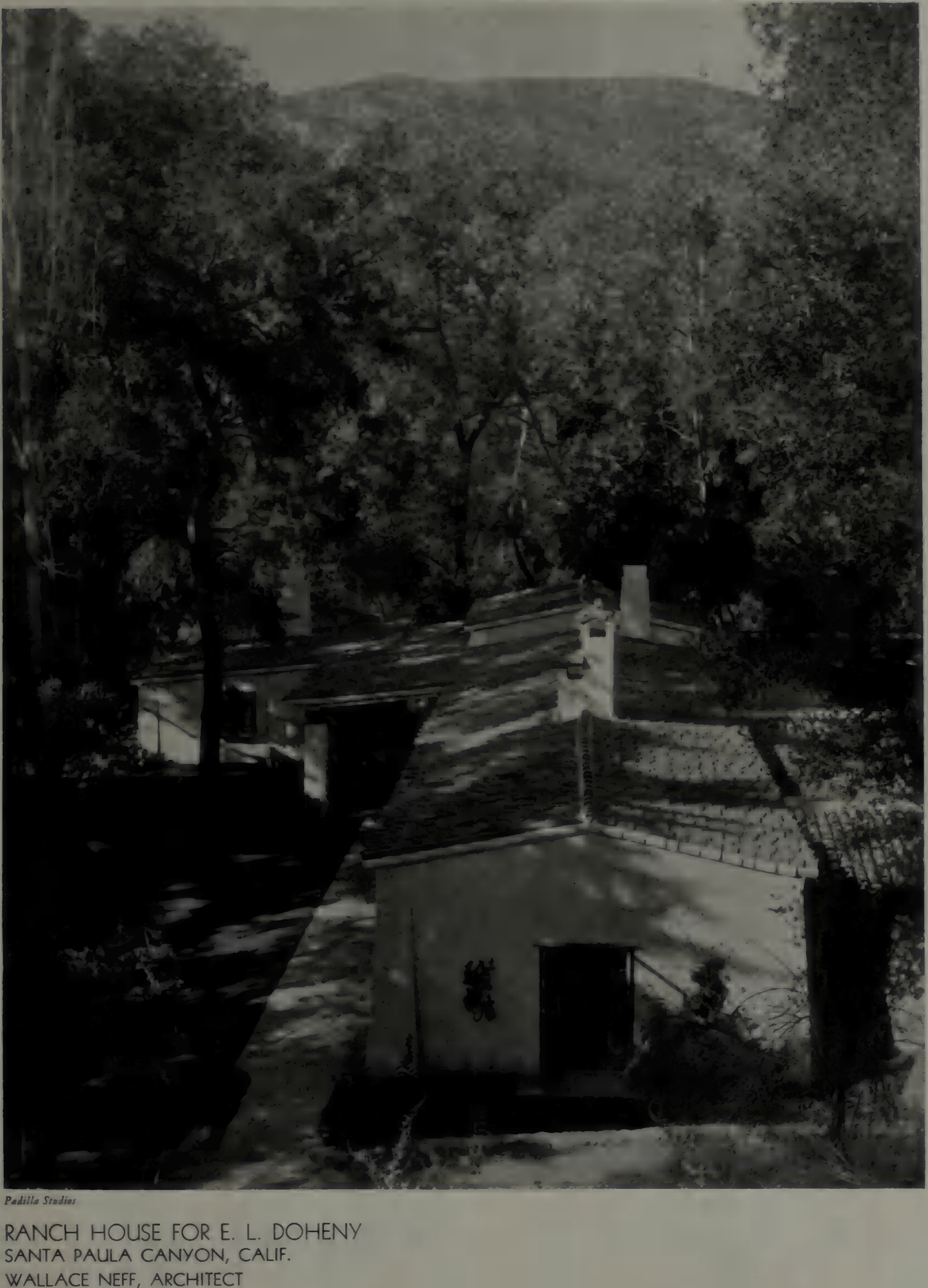
Site: along trout stream banked on each side with tremendous oak trees.

Roof: handmade burned clay tiles. Eaves are kept short to admit plenty of sunshine.

Chimneys: whitewashed brick with handmade tile caps.

Windows: California sugar pine.

Color scheme: walls of whitewashed brick; windows, shutters and iron work painted turquoise blue; tile floors and roof of a variegated rose shade.



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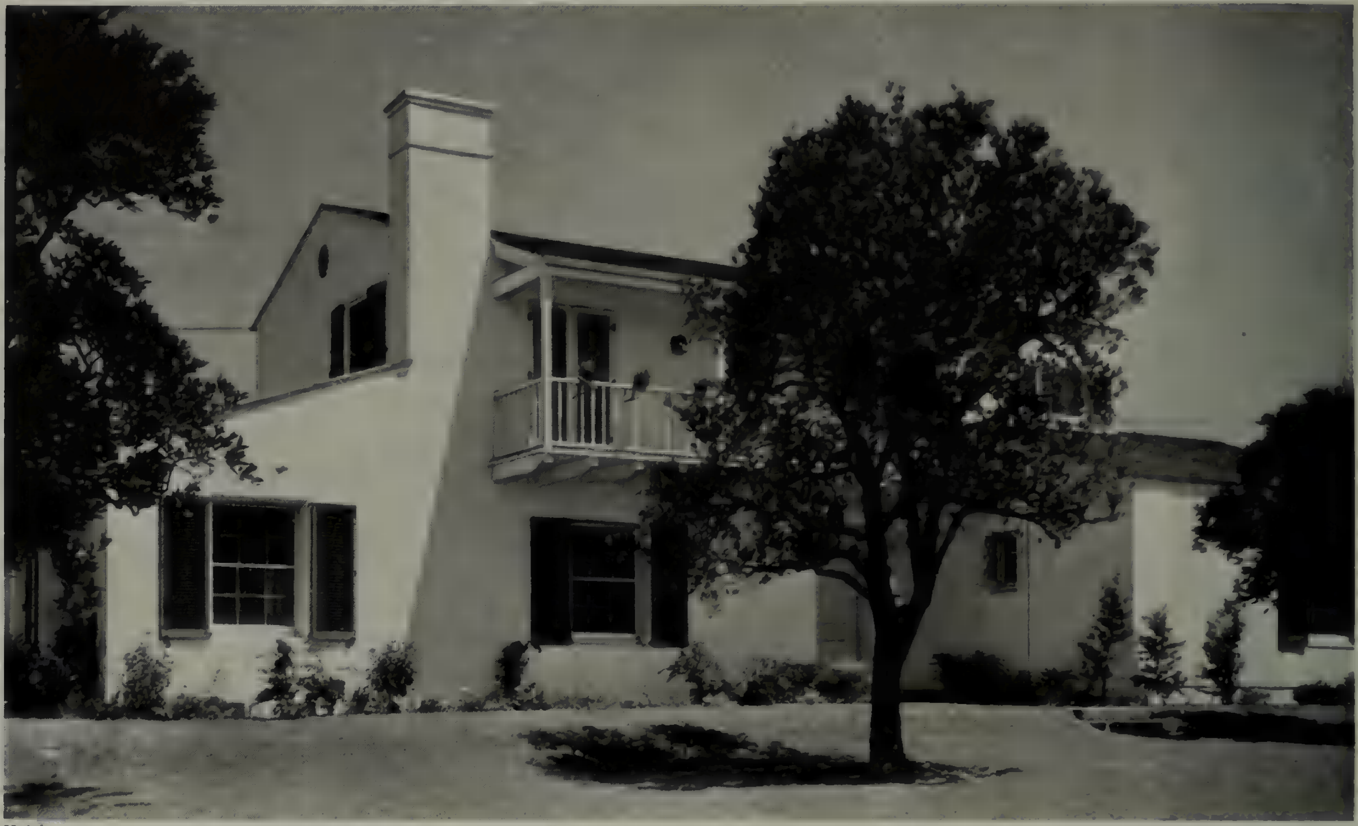


Haight

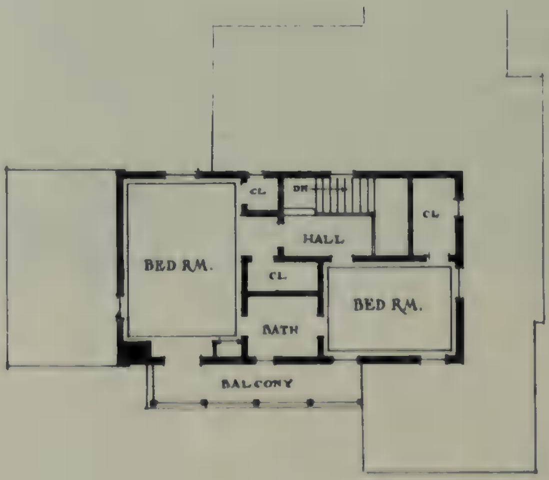
HOUSE OF MRS. WILLIAM REDING

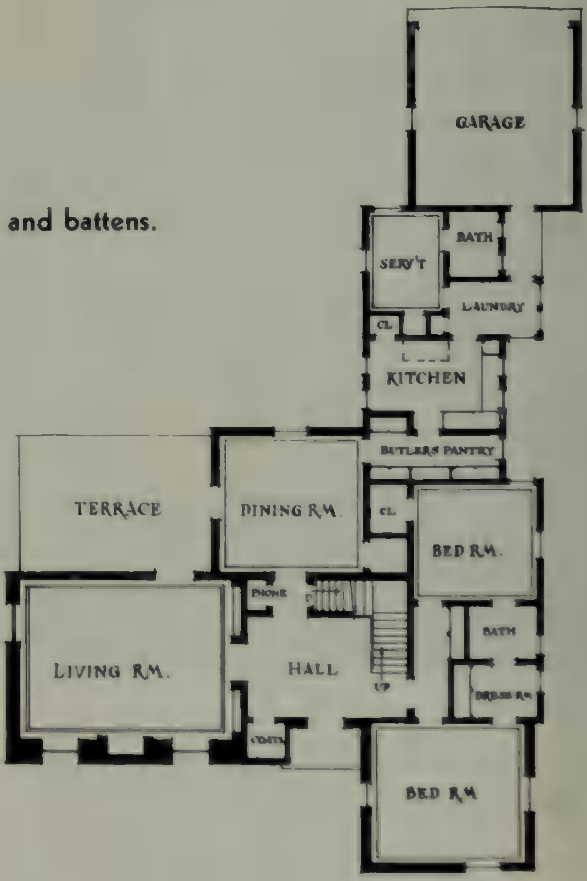
PASADENA, CALIF.
GARRETT VAN PELT, JR., ARCHITECT

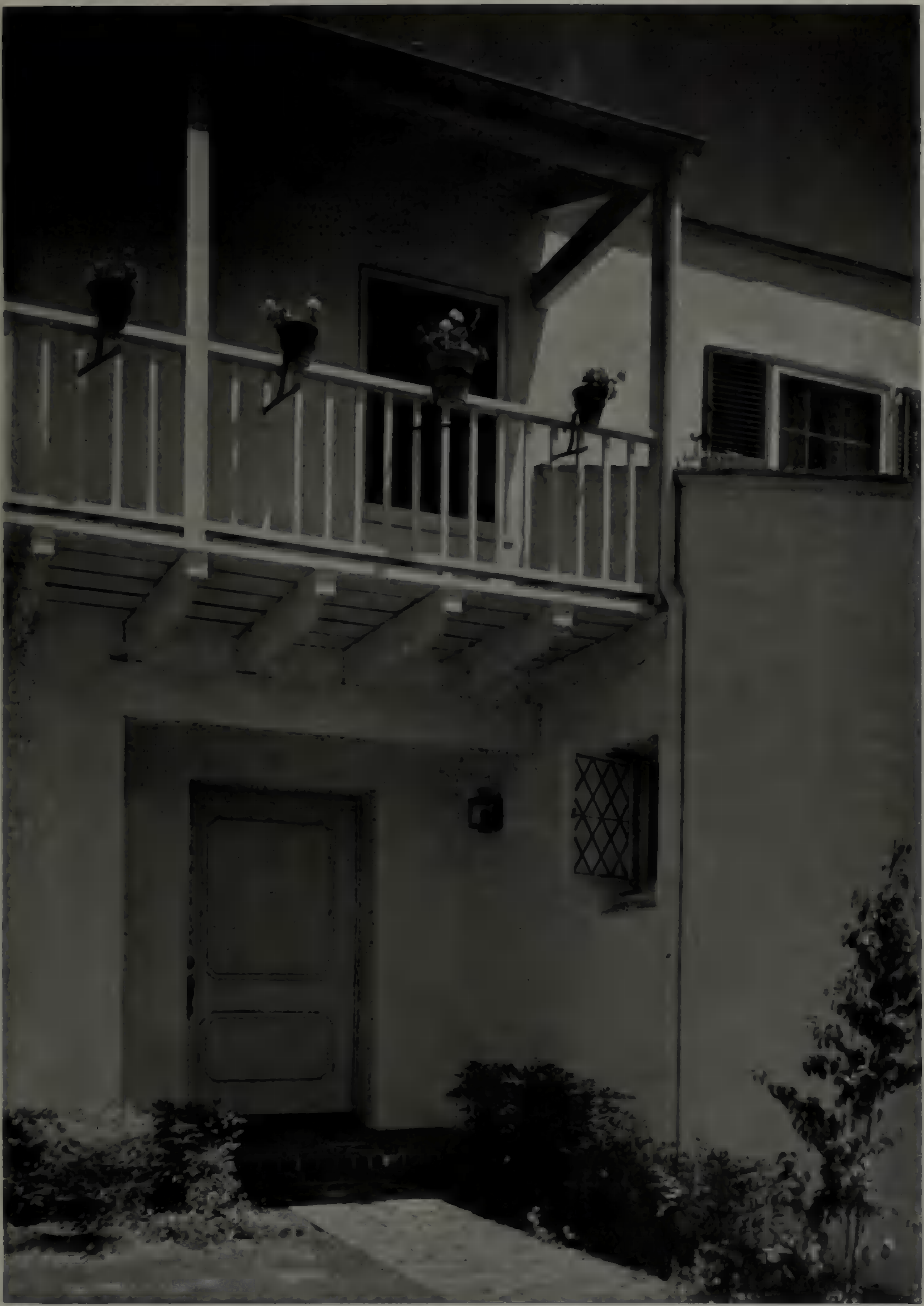
Construction: stucco with vertical boards and battens.

Roof: split shake.

Cost per sq. ft.: $4.

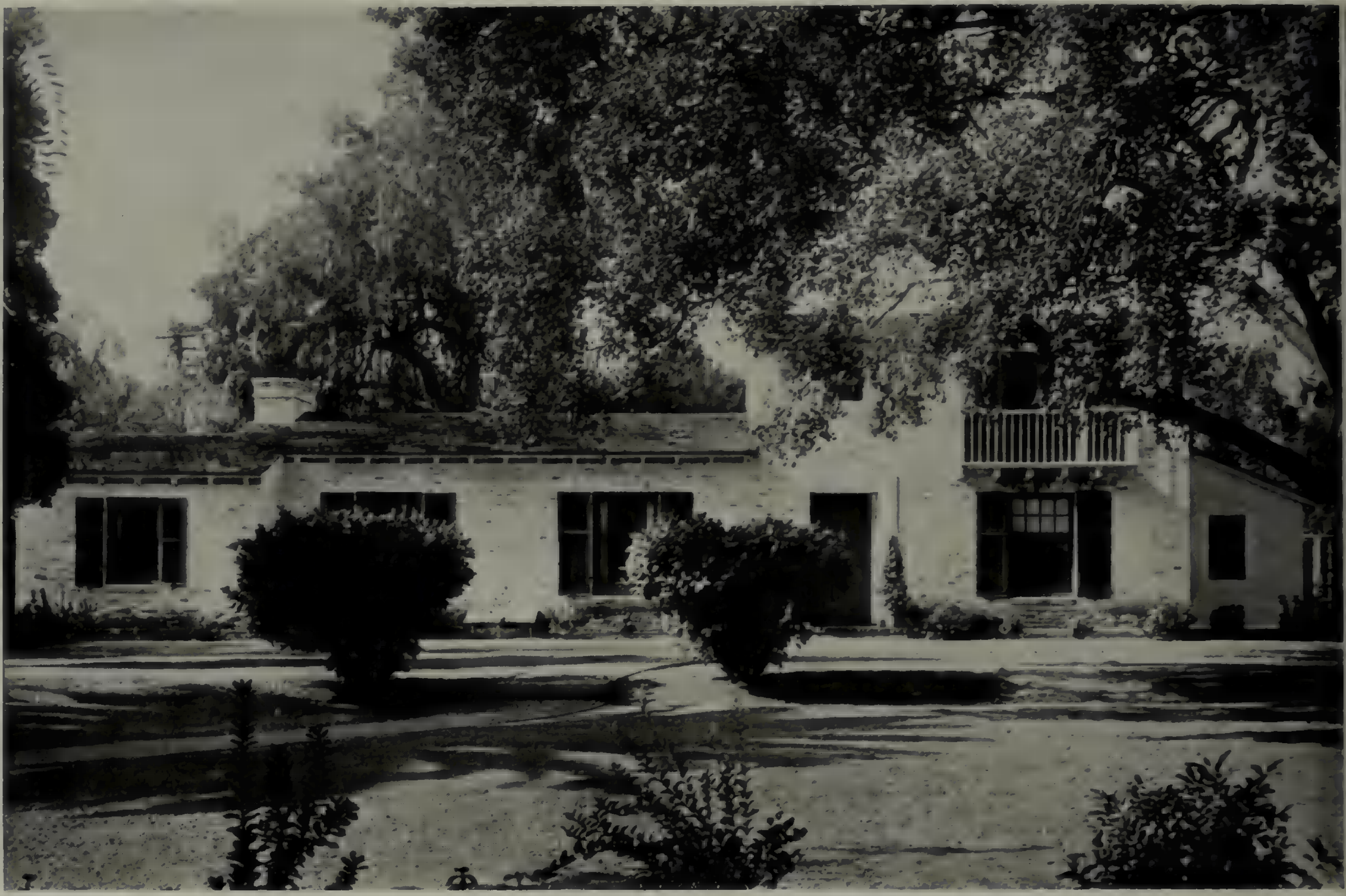






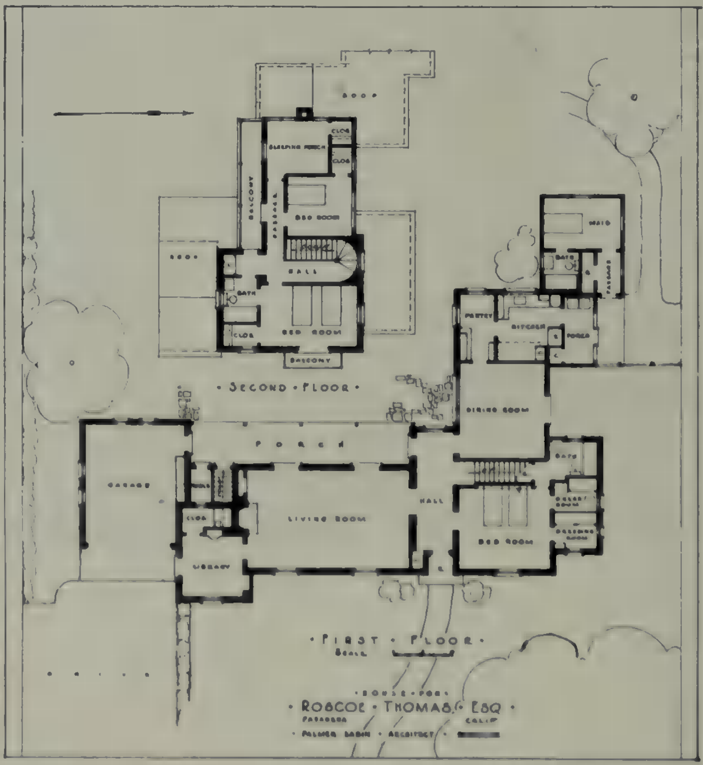
Haight

HOUSE OF MRS. WILLIAM REDING
PASADENA, CALIF.
GARRETT VAN PELT, JR., ARCHITECT



Clarke

HOUSE OF ROSCOE THOMAS
PASADENA, CALIF.
PALMER SABIN, ARCHITECT



Site: house planned to fit existing basement and original planting. Advantage taken of a large pepper tree and a large oak tree on the property.

Roof: cedar shingles laid slightly random.

Chimneys: common brick seconds from old foundation.

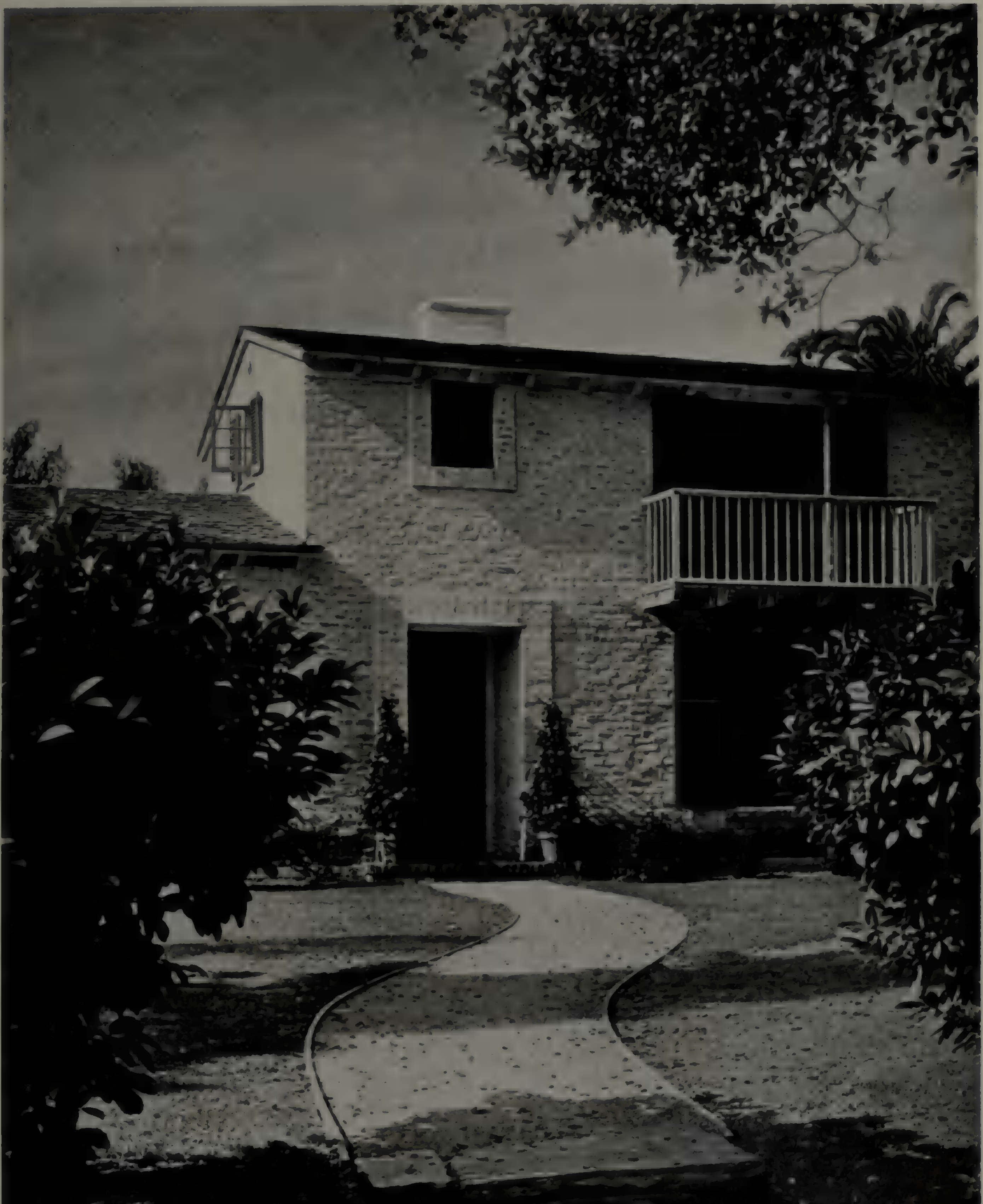
Windows: double-hung, wood.

Walls: common brick seconds slightly random with flush joints.

Color scheme: exterior of walls of whitewashed brick using a thin coat of whitewash to blend the cement-stained brick; all sash sage green; balconies whitewashed and painted white.

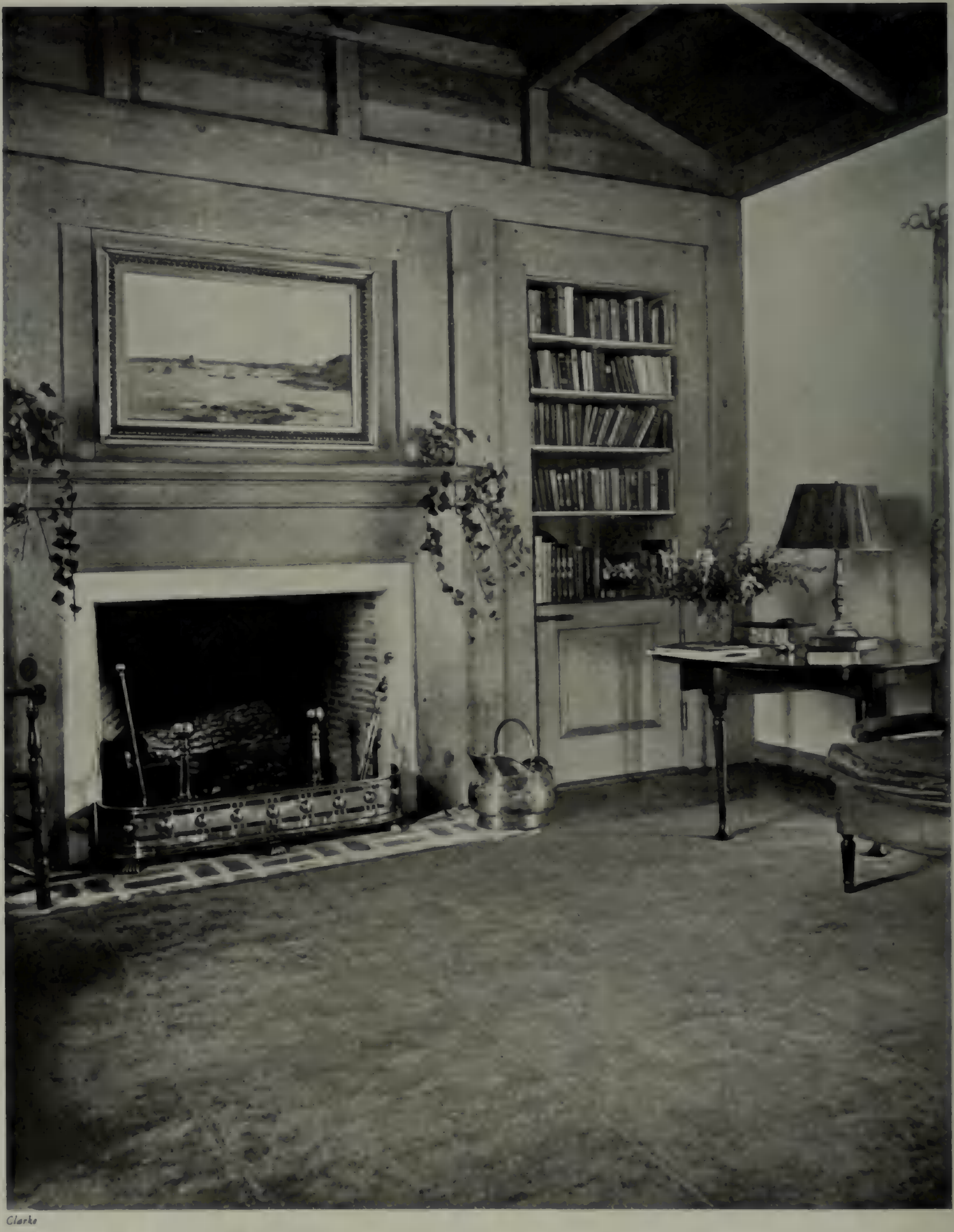
Design: full use made of materials from old house. Living room given major importance with garden on the west.

Cost per cubic foot: 45c.



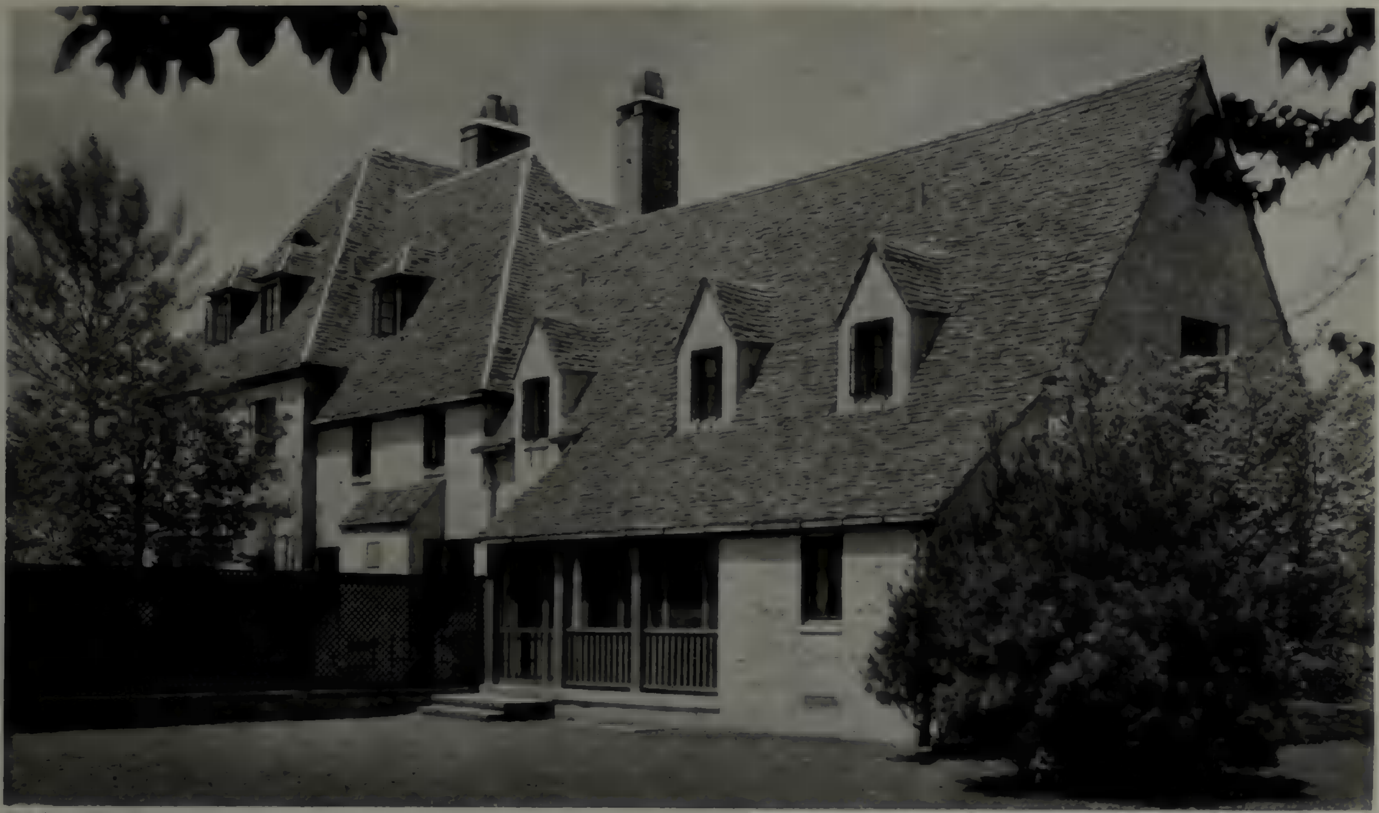
Clarke

HOUSE OF ROSCOE THOMAS
PASADENA, CALIF.
PALMER SABIN, ARCHITECT



Clarke

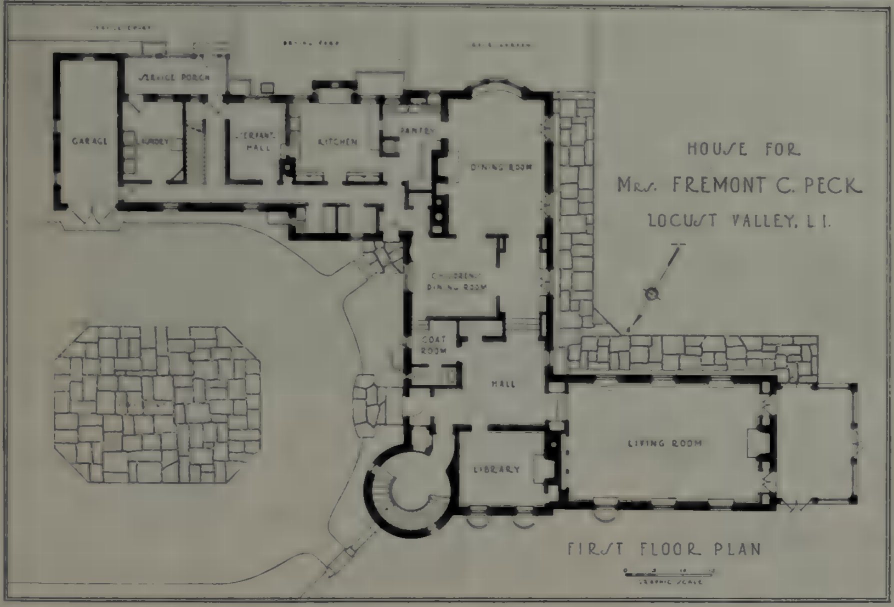
HOUSE OF ROSCOE THOMAS
PASADENA, CALIF.
PALMER SABIN, ARCHITECT



Nyholm and Lincoln

HOUSE OF MRS. FREMONT C. PECK

LOCUST VALLEY, LONG ISLAND
BENJAMIN W. MORRIS, AND
LANSING C. HOLDEN, JR., ARCHITECTS
ARMISTEAD FITZHUGH, LANDSCAPE ARCHITECT



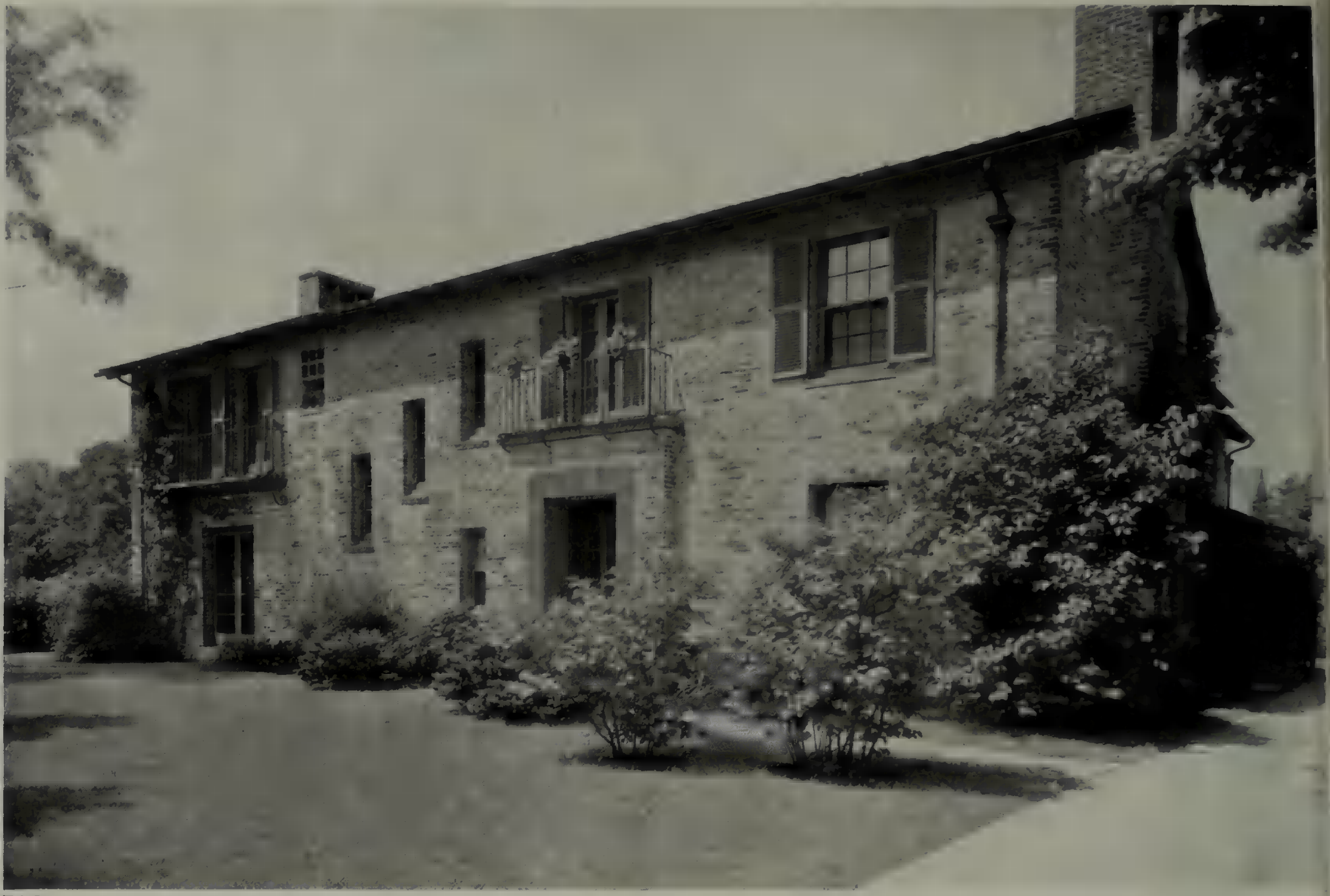
Roof: shingle tile, dark gray-green at the eaves to orange at the ridge.

Chimneys: common brick with burnt headers freely used and terra cotta chimney pots.

Windows: steel casement.

Walls: common brick built without plumb line, painted with a cream color waterproof cement wash. Tower windows and main entrance doorway trimmed with imported French limestone.

Cost per cu. ft.: $1.07.



Toloff

HOUSE OF FRED P. WARREN
EVANSTON, ILLINOIS
REGINALD D. JOHNSON, ARCHITECT
RUTH DEAN, LANDSCAPE ARCHITECT

Site: level city lot.

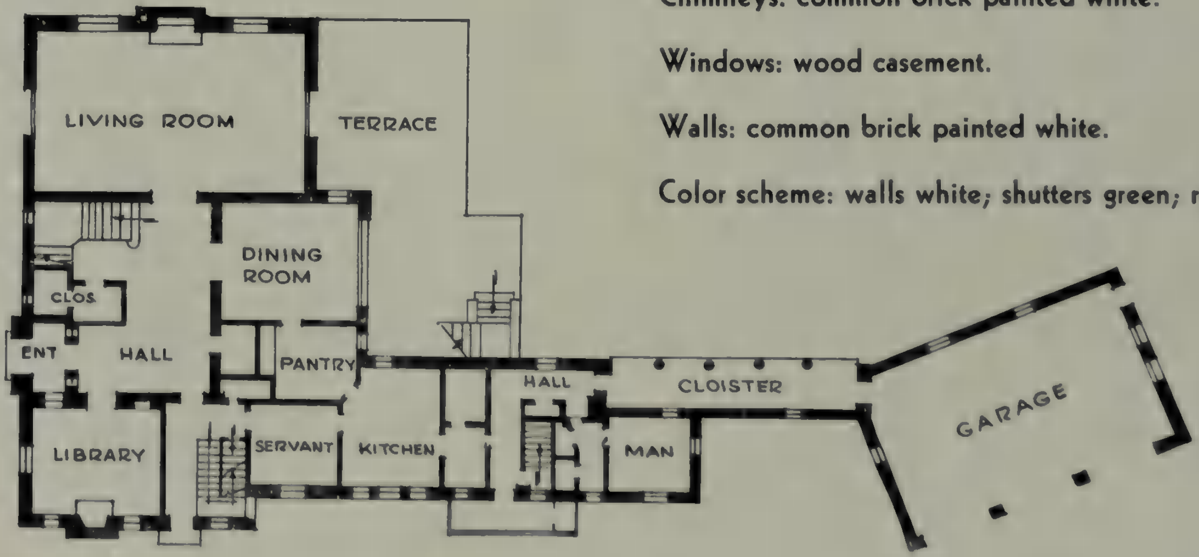
Roof: heavy shingles.

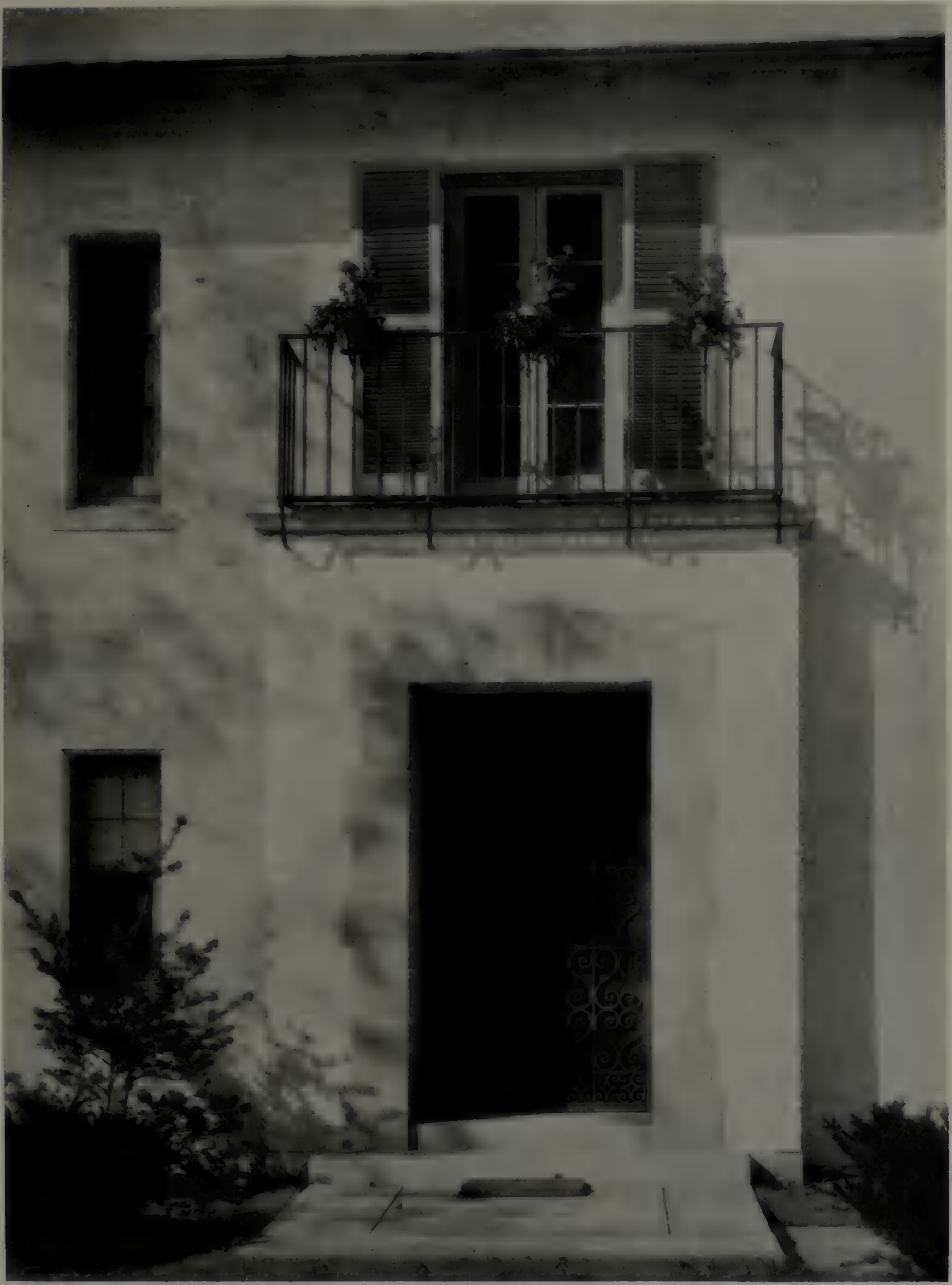
Chimneys: common brick painted white.

Windows: wood casement.

Walls: common brick painted white.

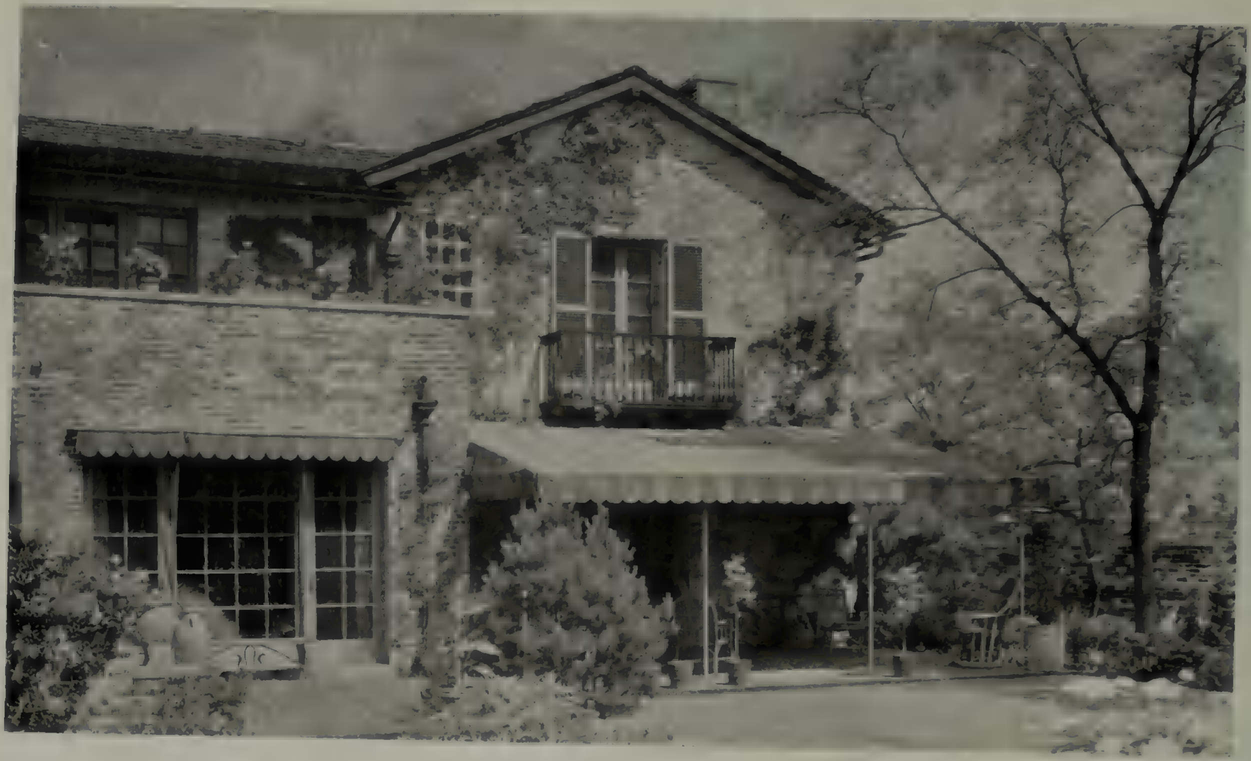
Color scheme: walls white; shutters green; roof natural.

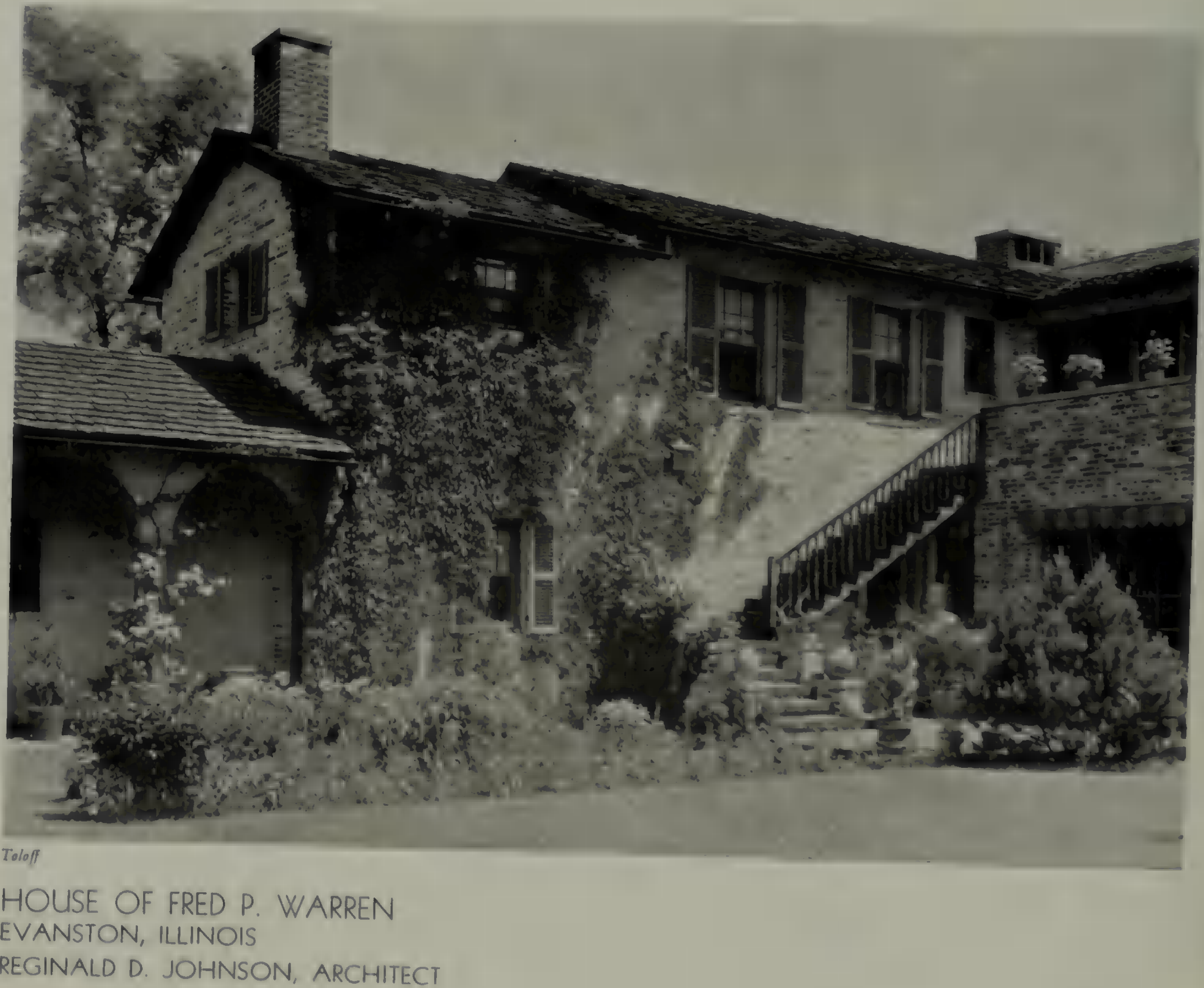




Teloff

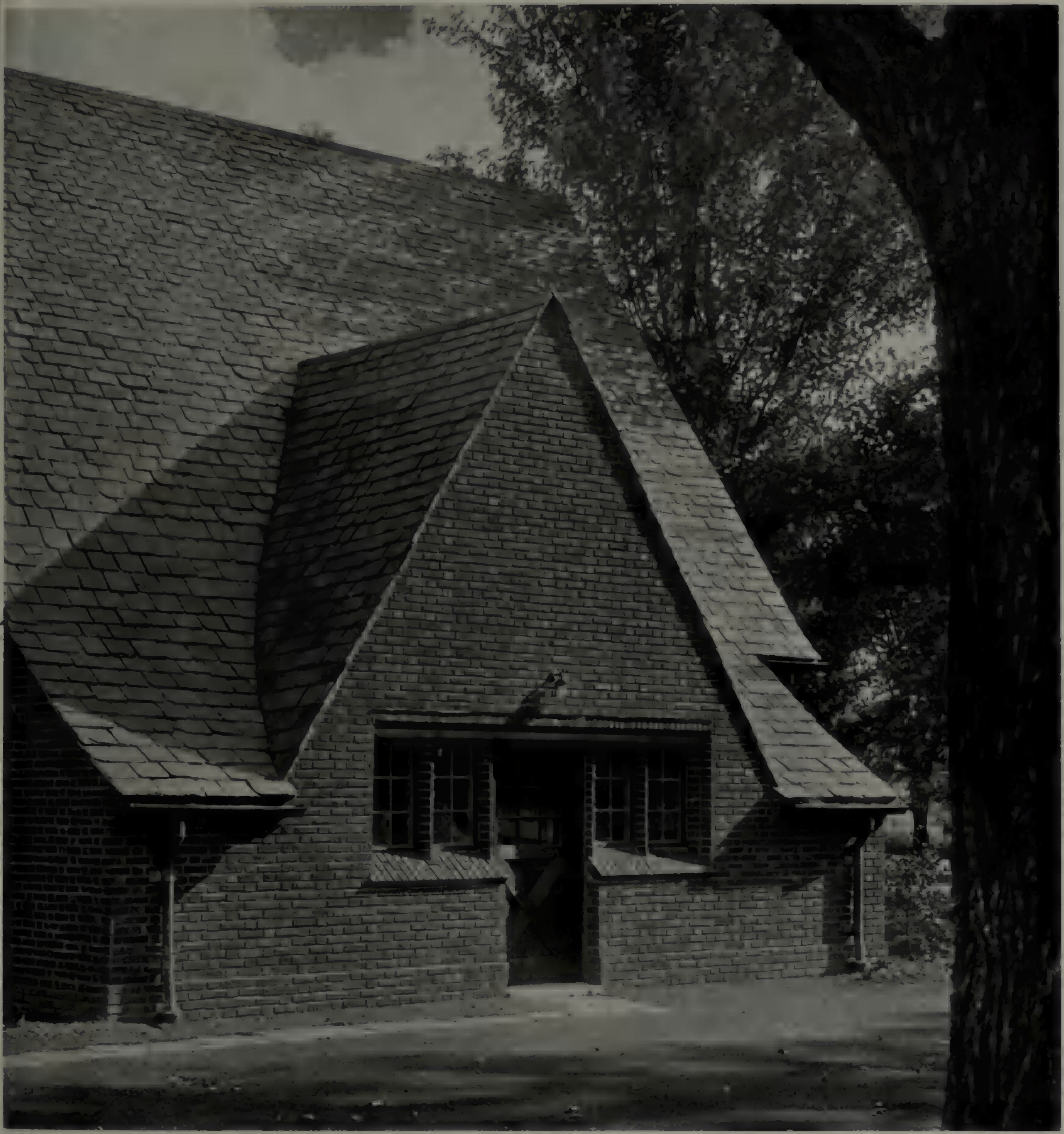
HOUSE OF FRED P. WARREN
EVANSTON, ILLINOIS
REGINALD D. JOHNSON, ARCHITECT





Teloff

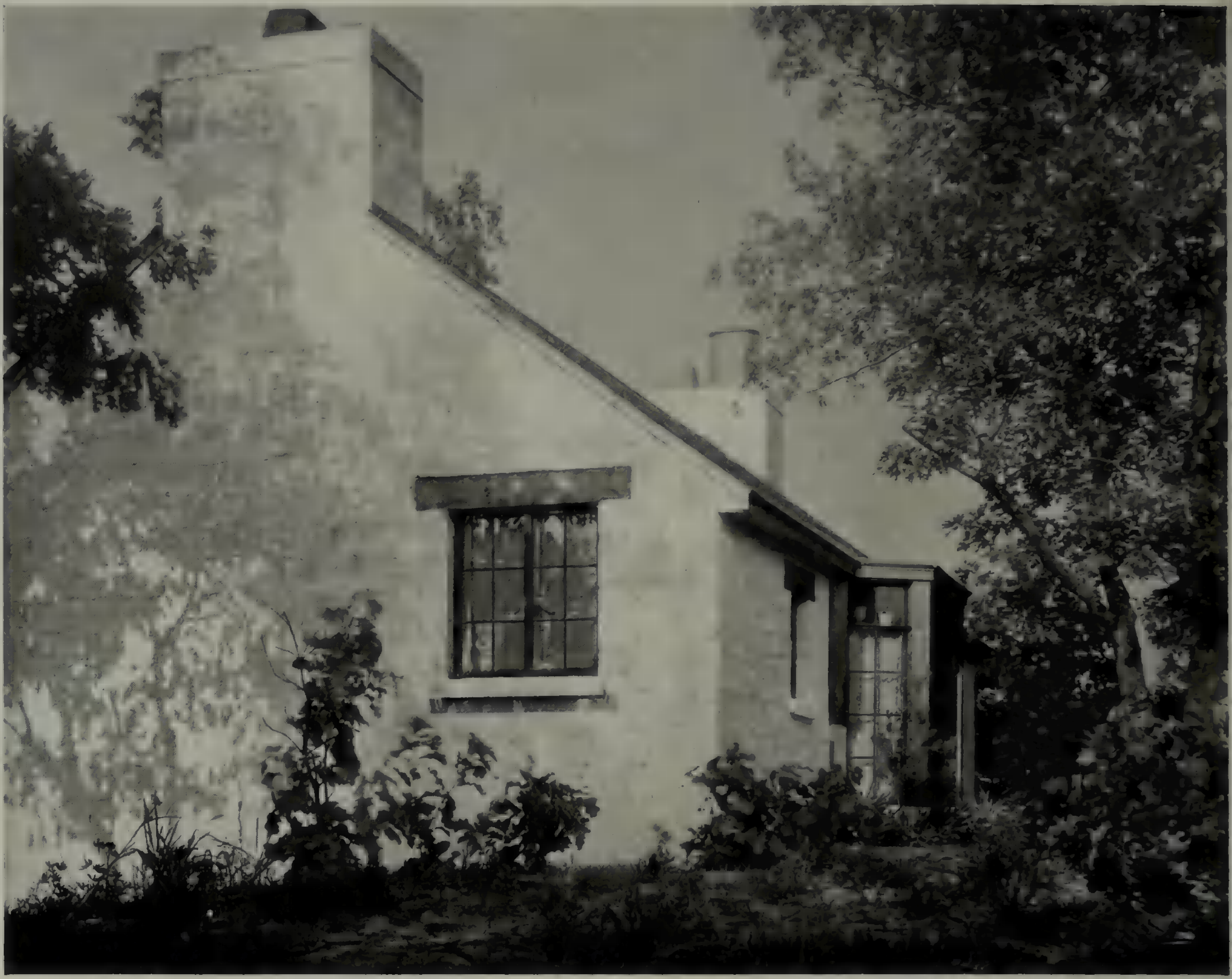
HOUSE OF FRED P. WARREN
EVANSTON, ILLINOIS
REGINALD D. JOHNSON, ARCHITECT



Nyholm

HOUSE FOR JAMES TURNER
GROSSE POINTE, MICH.
HENRY F. STANTON, ARCHITECT

Rear of GARAGE, in which is located the heating plant, furnishing washed air as well as heat to the house. Roof: slates. Windows: steel casements with leaded glass. Walls: brick with raked joints.

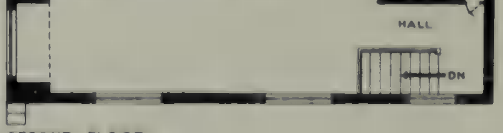


WEEK-END COTTAGE,
CLIFTON TIDHOLM AND ELWOOD KOCH
OGDEN DUNES, INDIANA
HARRY HOWE BENTLEY, ARCHITECT

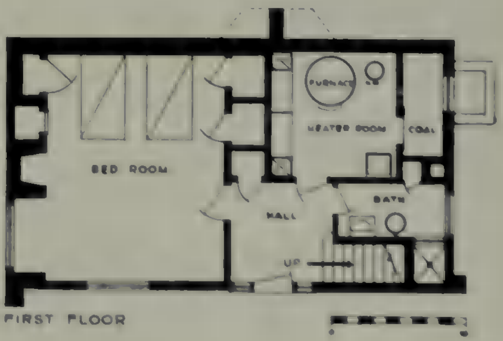
Site: slope of dune allows part of lower story to be above grade: bedroom and bath are placed here, and entire upper floor becomes a large living room.

Construction: haydite blocks, exposed and finished with white cement paint. Windows are metal casements. Roof of asbestos shingles.

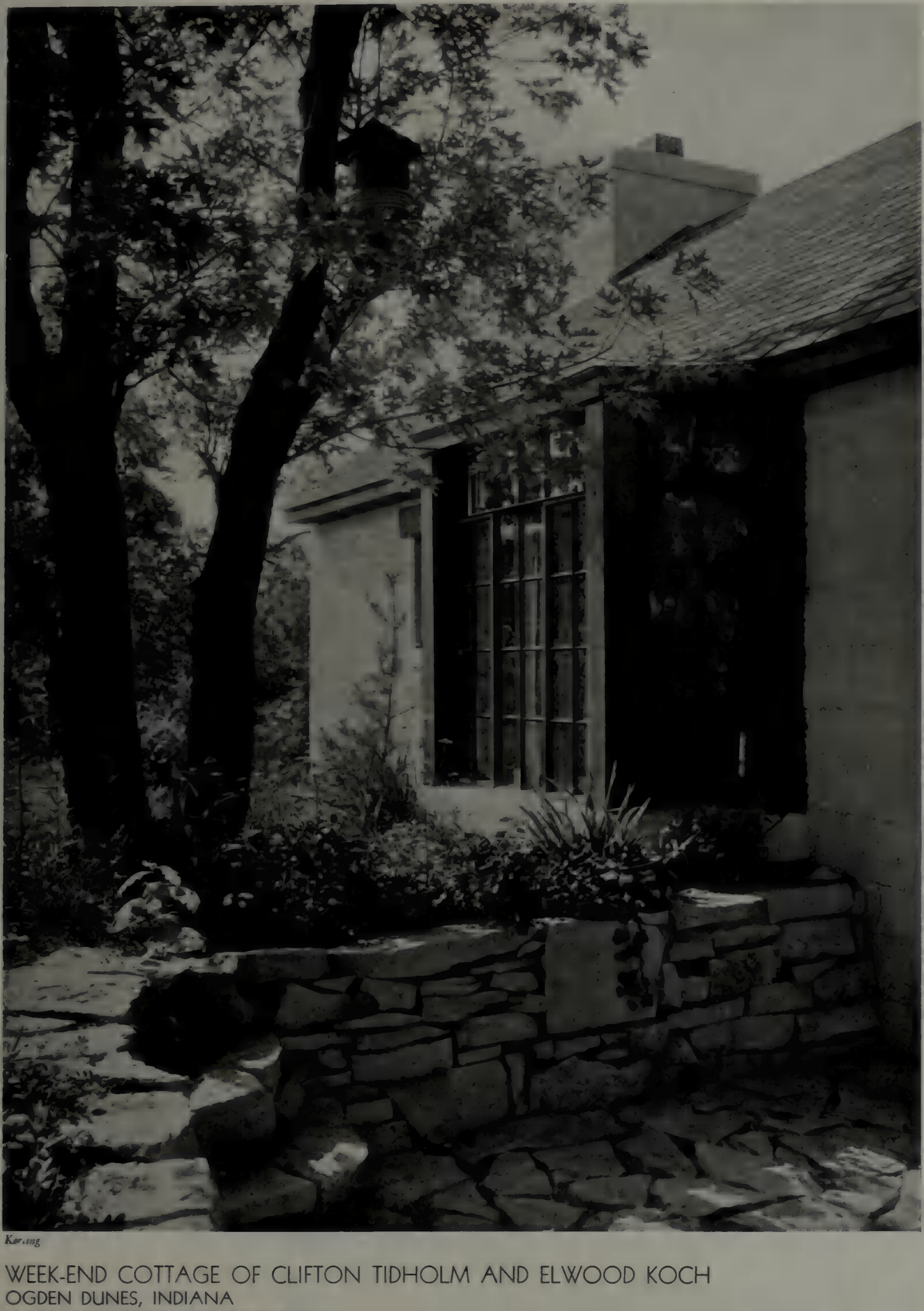
Cost per cu. ft.: about 45c, including water supply and sewage disposal systems.



SECOND FLOOR

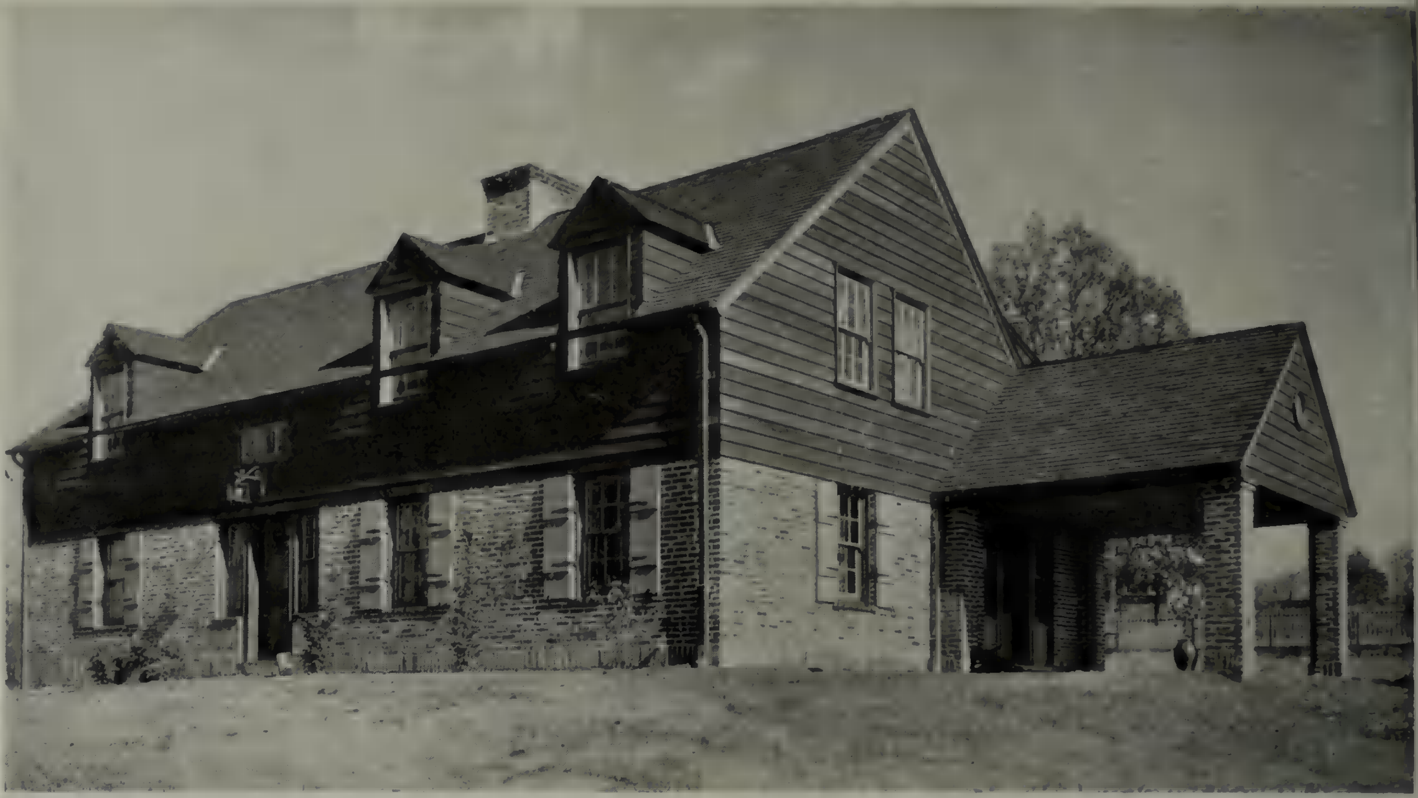


FIRST FLOOR



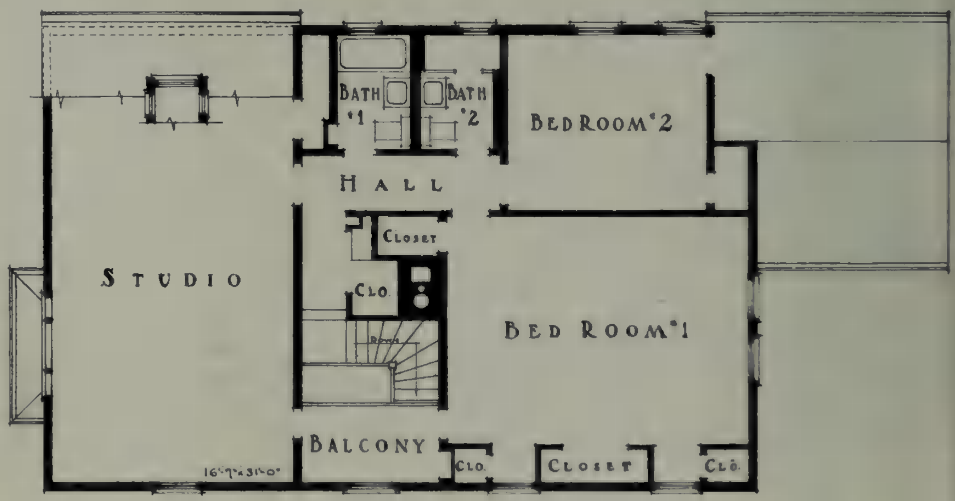
Korling

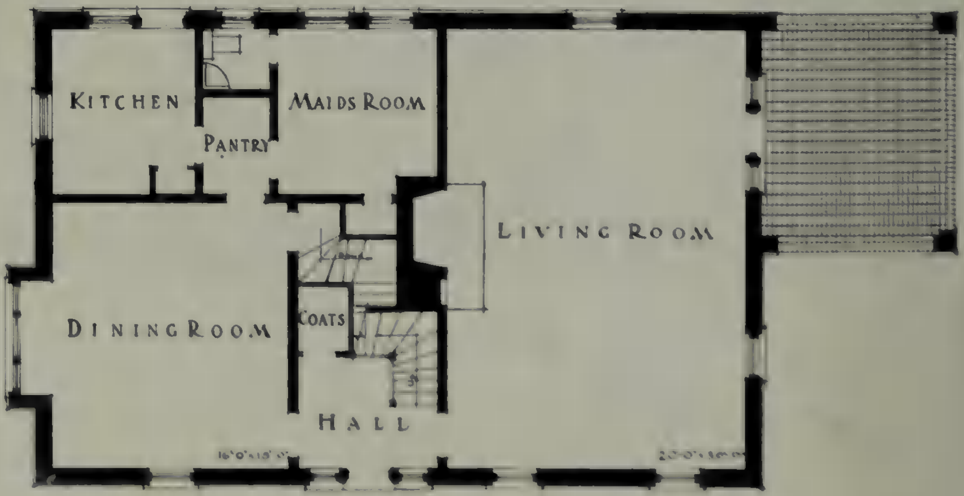
WEEK-END COTTAGE OF CLIFTON TIDHOLM AND ELWOOD KOCH
OGDEN DUNES, INDIANA
HARRY HOWE BENTLEY, ARCHITECT

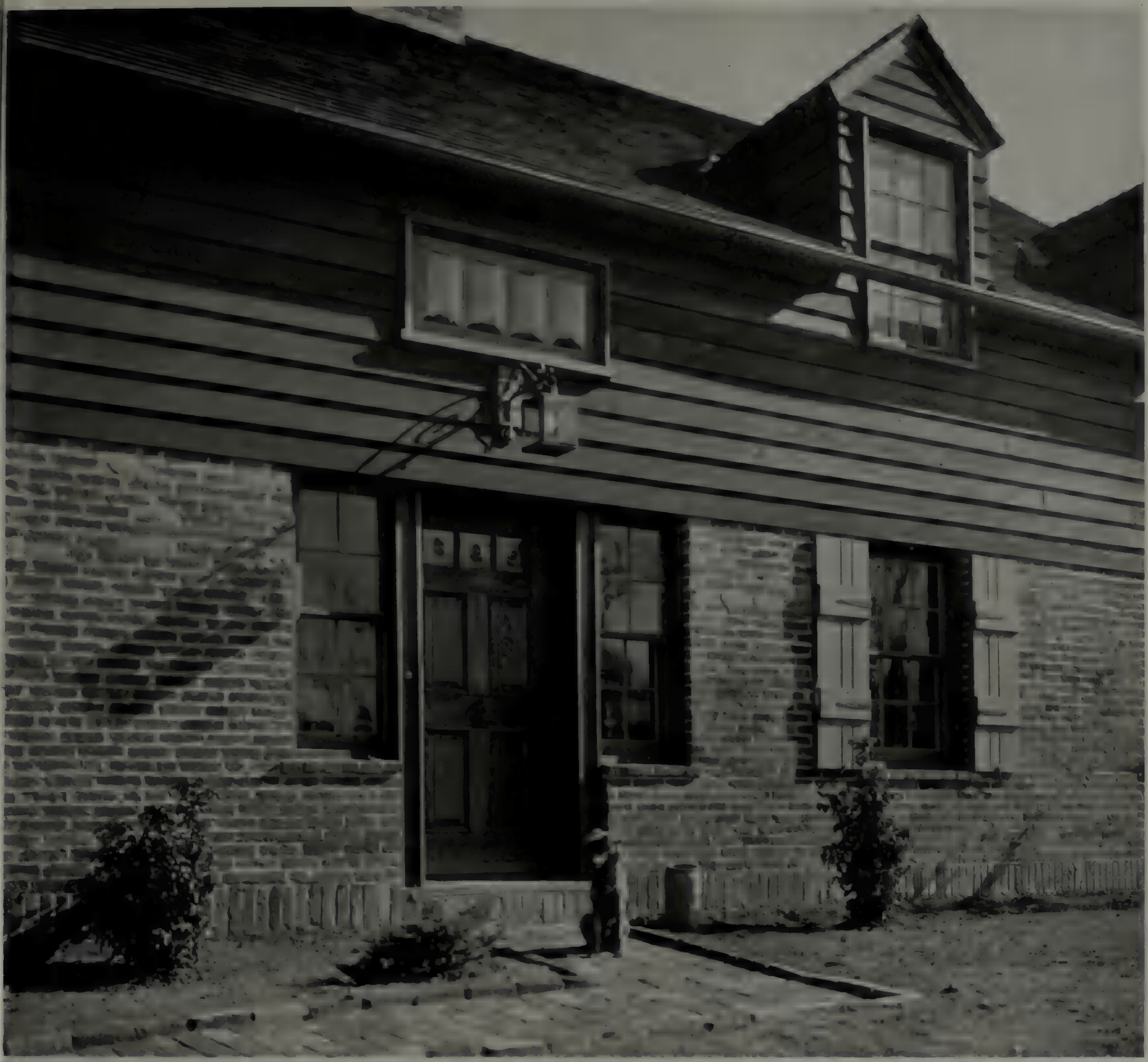


Trefts

HOUSE FOR E. H. PARKS
HAMPTON PARK
ST. LOUIS COUNTY, MO.
A. B. M. CORRUBIA,
ARCHITECT
E. H. PARKS,
LANDSCAPE ARCHITECT







Trefts

HOUSE FOR E. H. PARKS
HAMPTON PARK, ST. LOUIS COUNTY, MO.
ANGELO B. M. CORRUBIA, ARCHITECT

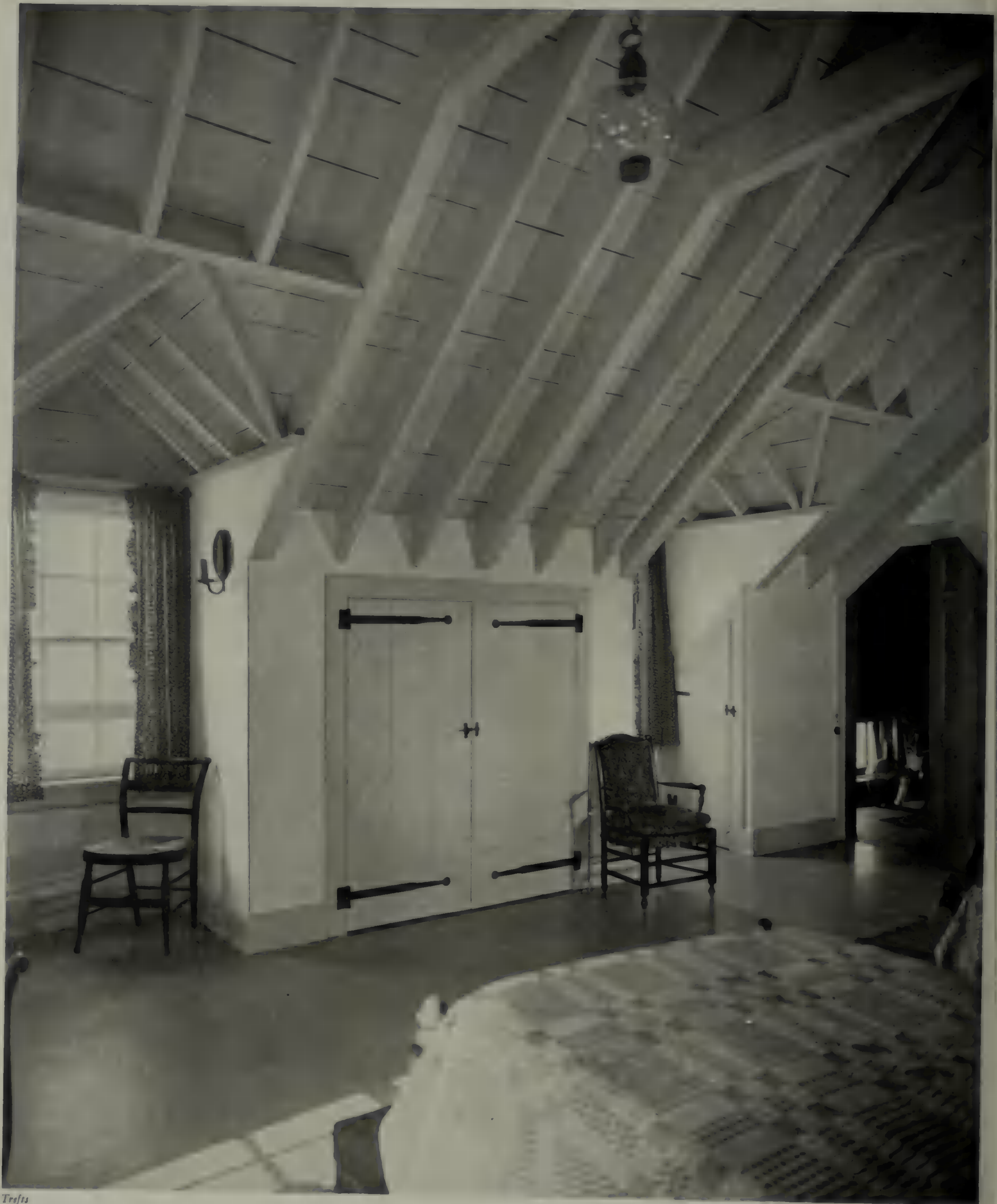
Site: house set back about 300′ from road and about 25′ in back of a small creek.

Points of interest in design: house was designed primarily as a studio residence and as a setting for a collection of early American furniture.

Roof: underside left exposed, forming the ceiling of the second floor. Insulation from celotex covered with wood shingles with a 2½″ air space. Ceilings painted and stained.

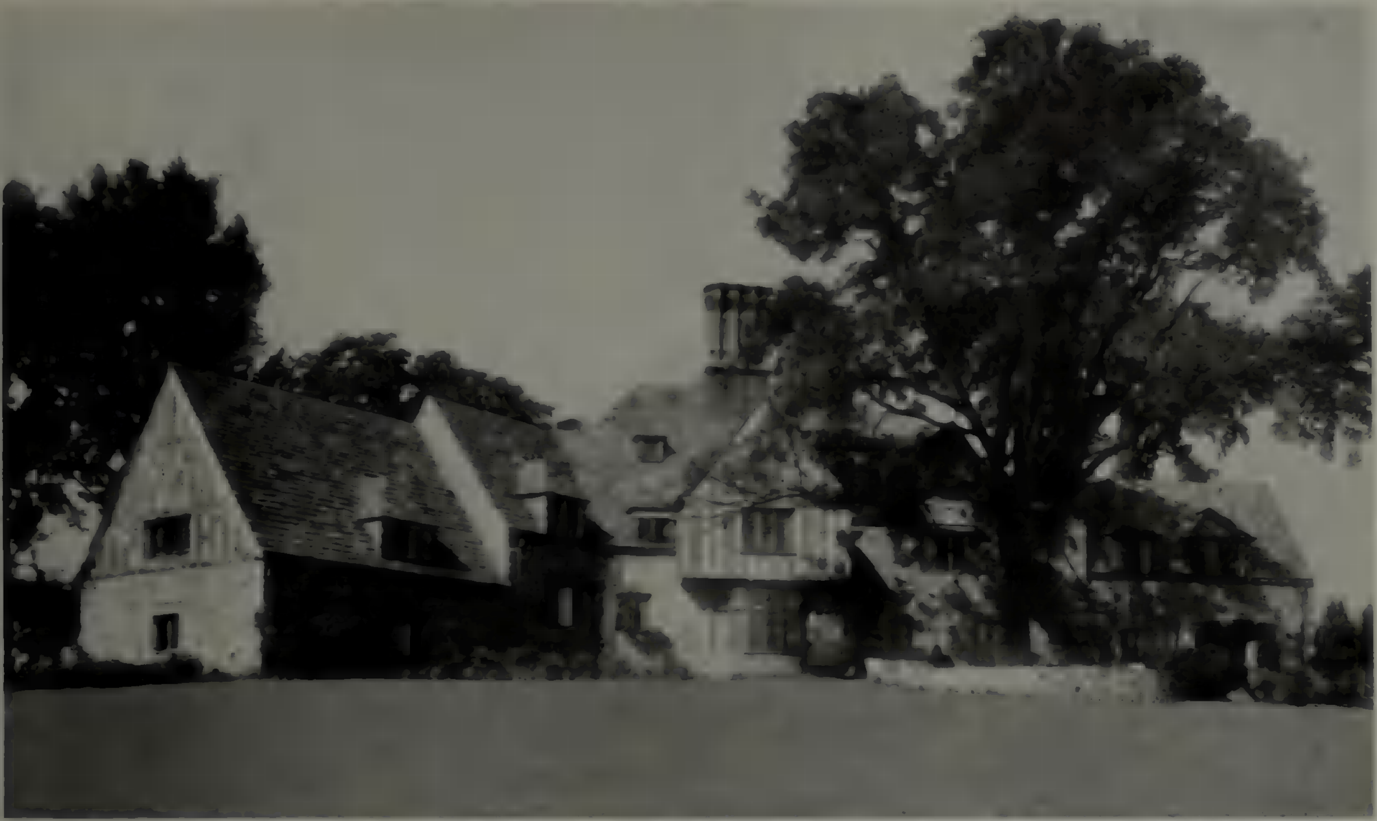
Color scheme: brick walls light red; siding and shingles stained brown; shutters painted a gray-green; window frames and main entrance stained brown; kitchen door and frame, porch door and frame, painted blue; copper work left natural. All floors throughout were yellow pine of random widths, being painted in some rooms and stained in others.

Total cost: $20,000. Cost per cu. ft.: 42c.



Trefts

HOUSE FOR E. H. PARKS
HAMPTON PARK, ST. LOUIS COUNTY, MO.
ANGELO B. M. CORRUBIA, ARCHITECT


Gillies

HOUSE OF H. M. LEINBACH

WYOMISSING, PA.

LEWIS BOWMAN, ARCHITECT
ELMER A. MUHS, LANDSCAPE ARCHITECT

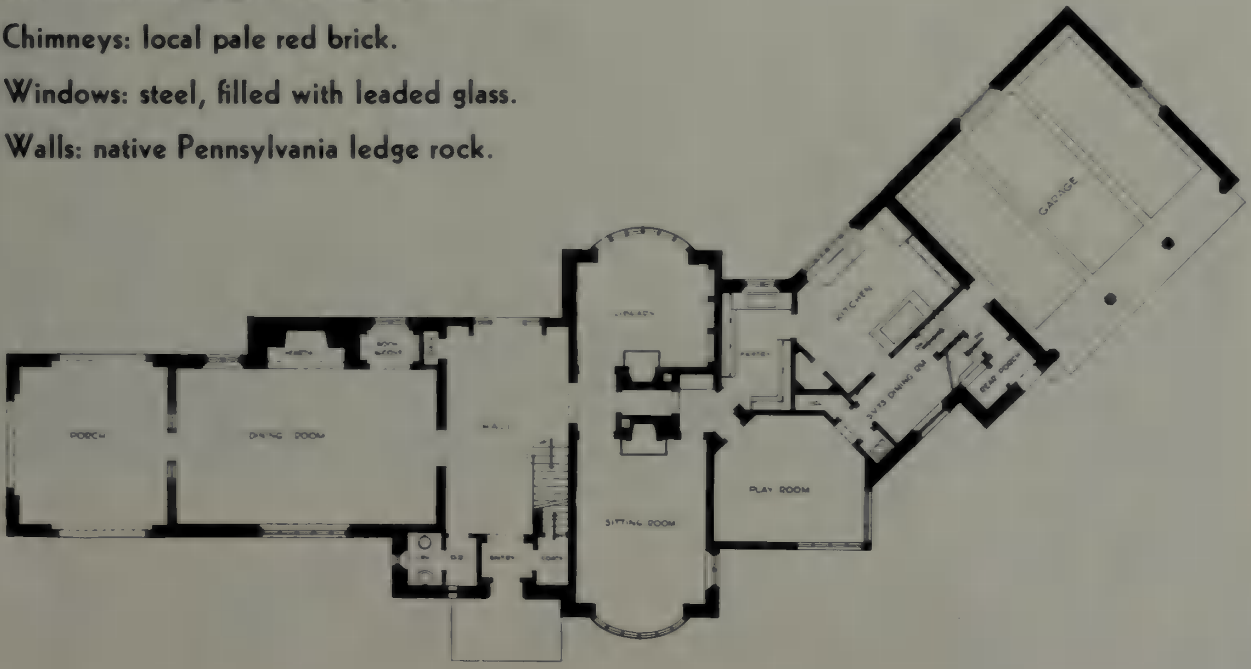
Site: a continuous slope. The entrance court was cut into the bank.

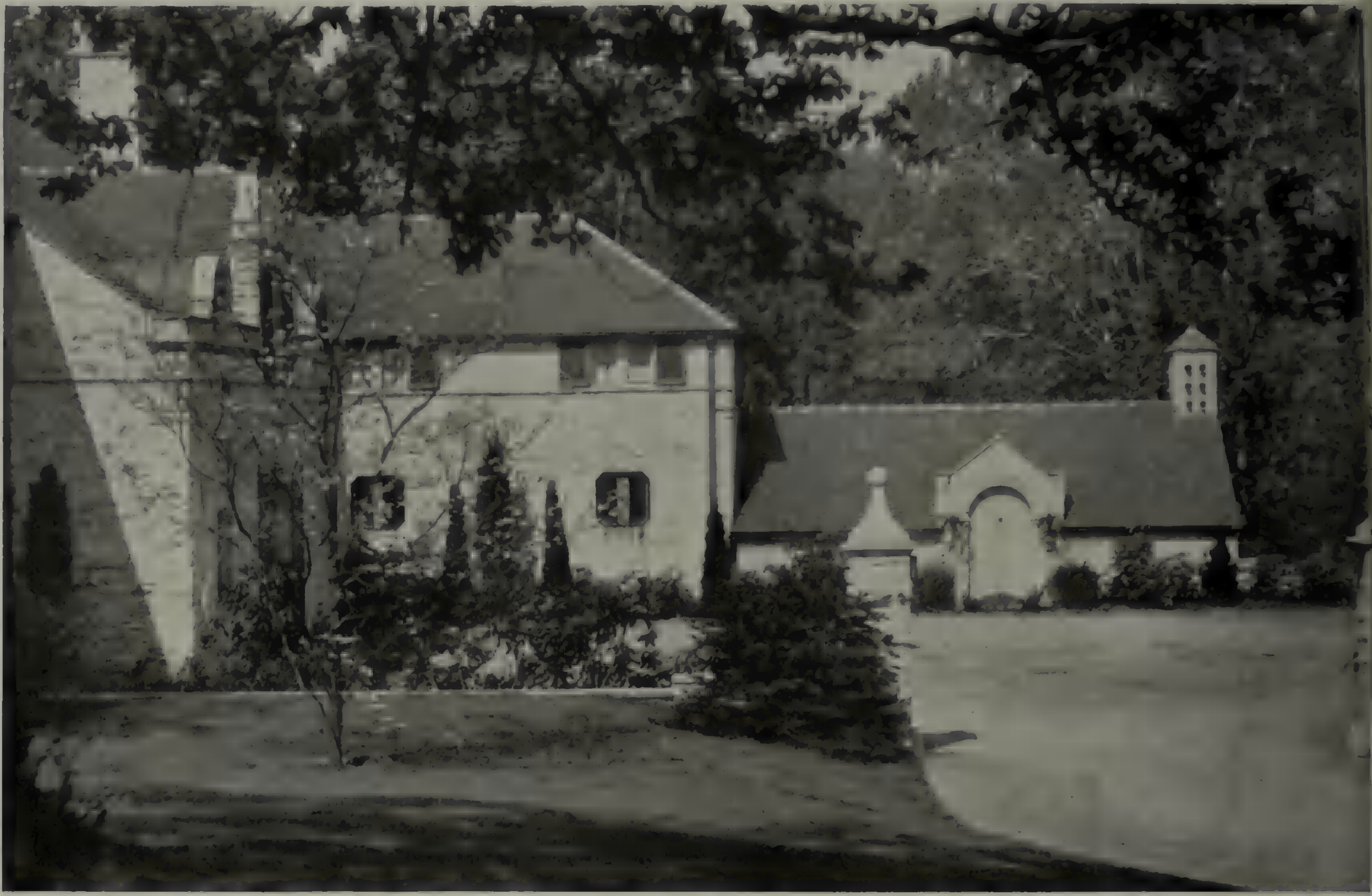
Roof: weathering green and gray slate.

Chimneys: local pale red brick.

Windows: steel, filled with leaded glass.

Walls: native Pennsylvania ledge rock.

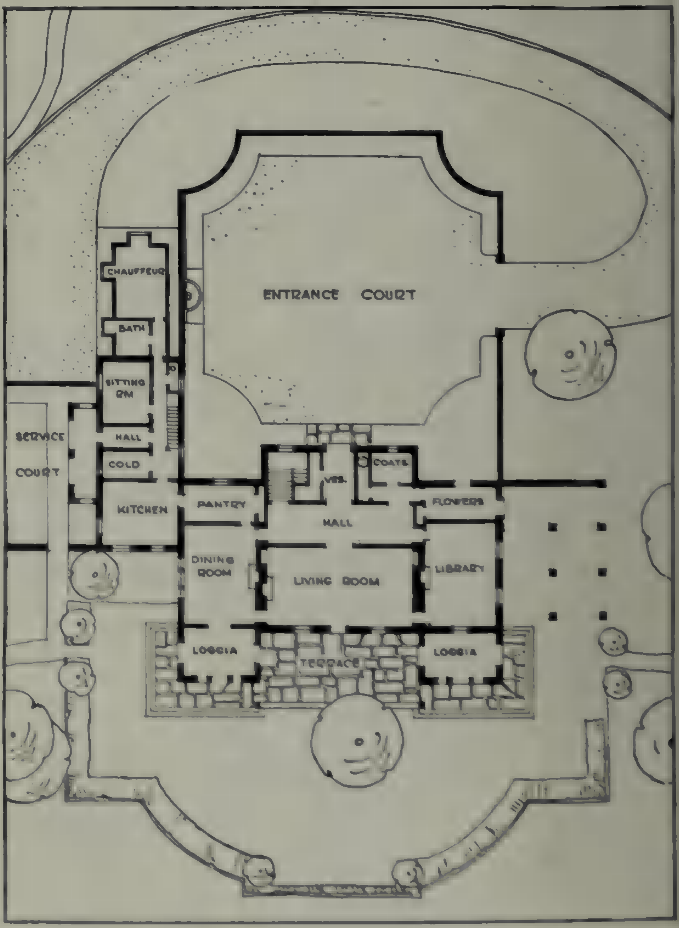




Rittase

HOUSE OF A. G. B. STEEL

CHESTNUT HILL, PA.
ROBERT R. McGOODWIN
ARCHITECT

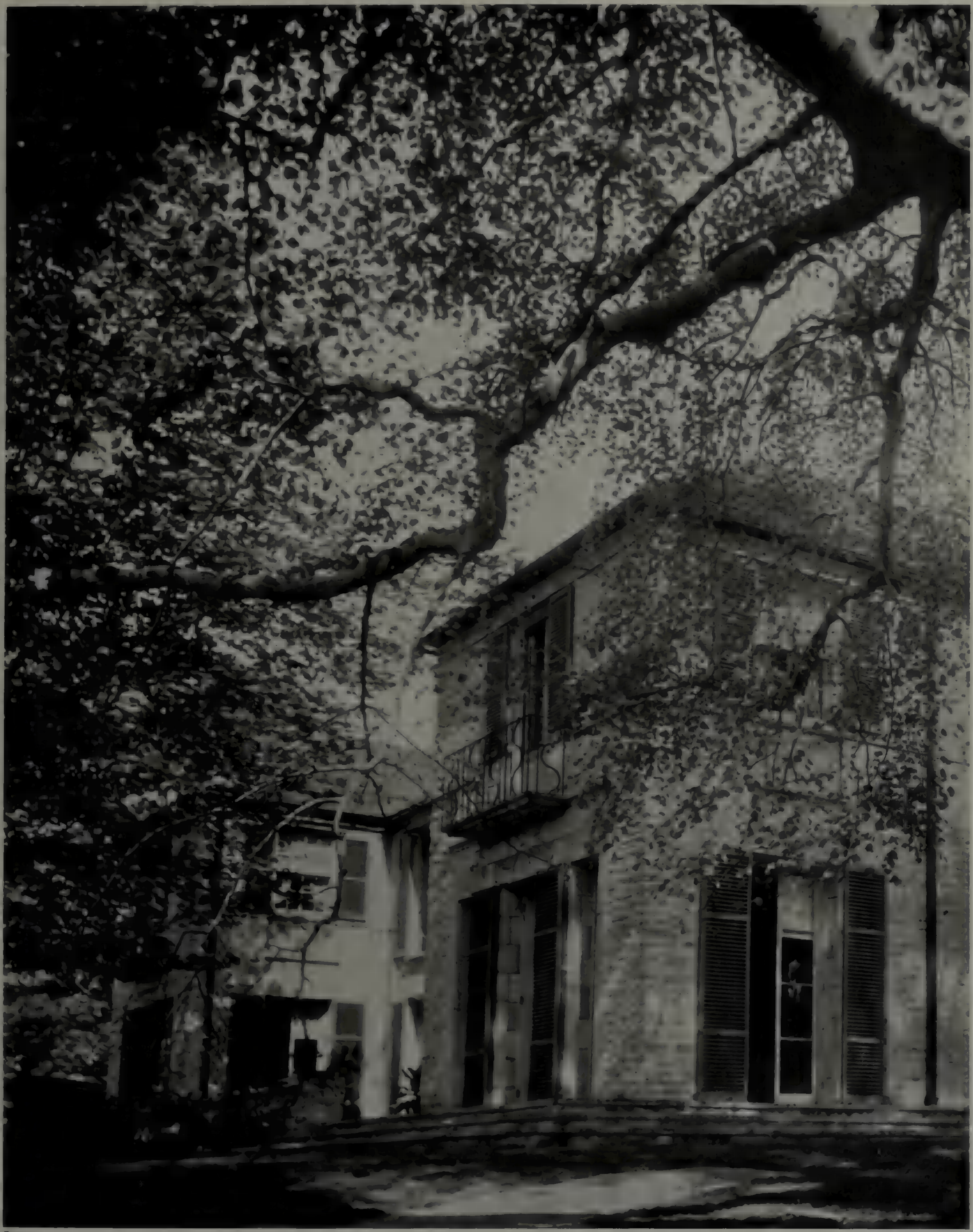


Site: wooded knoll comprising about ten acres. Steep contours permit use of basement of wing for large garage. Principal rooms have privacy, view of garden and southern exposure.

Roof: handmade shingle tiles of varying shades of dark red and brown.

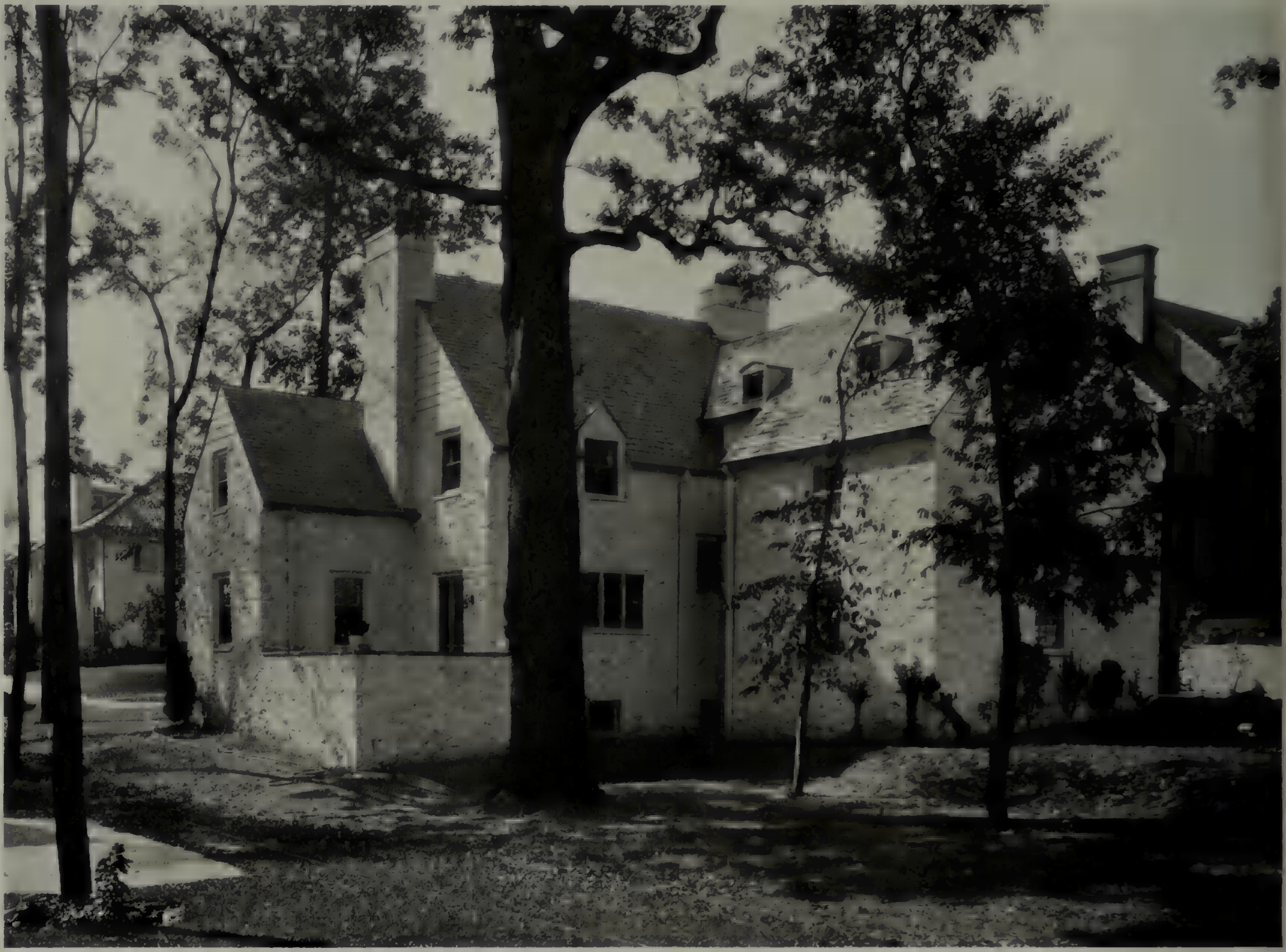
Walls: local stone laid random range with flush joints, and washed grayish-yellow.

Chimneys: brick, washed with same mixture as walls, and capped with flagstone.



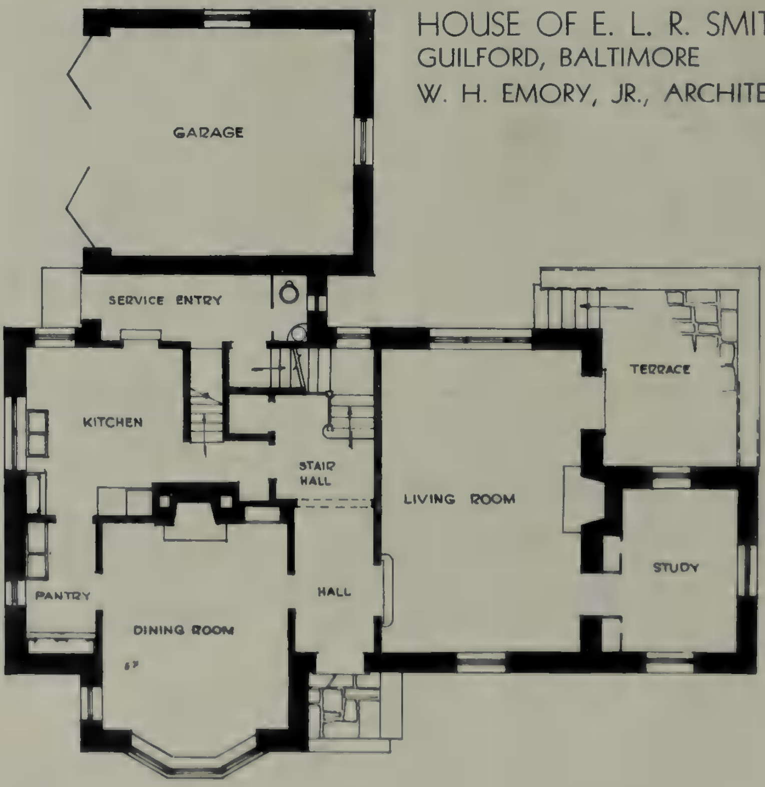
Rittase

HOUSE OF A. G. B. STEEL
CHESTNUT HILL, PA.
ROBERT R. McGOODWIN, ARCHITECT



HOUSE OF E. L. R. SMITH

GUILFORD, BALTIMORE
W. H. EMORY, JR., ARCHITECT



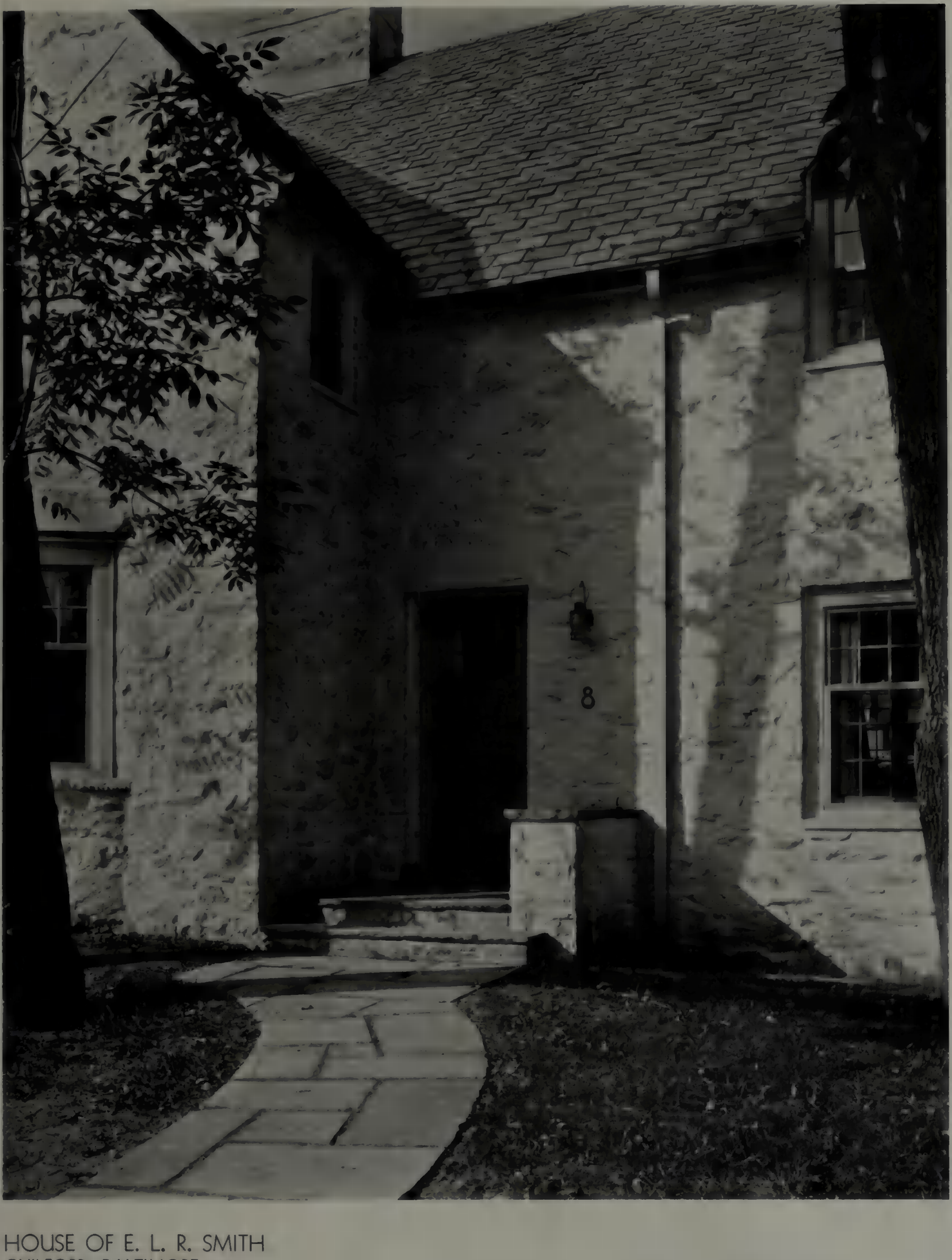
Site: difficulties were experienced in planning because of the narrowness and contours of the lot and location of a fine large oak tree, which it was desirable to keep without disturbing the roots.

Roof: unfaded green and gray-black slate, random widths, graduated, from 10″ to 4″ exposure.

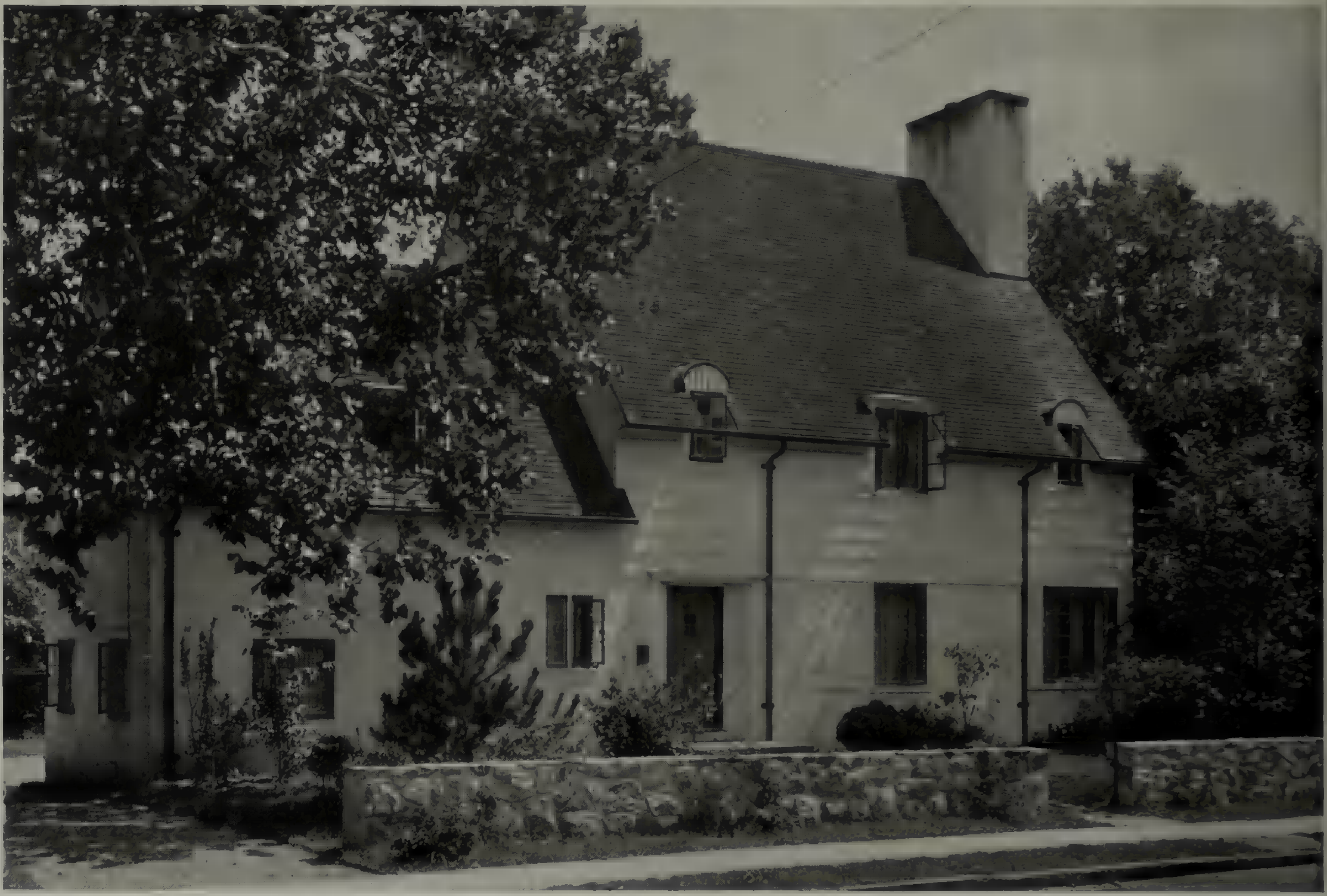
Windows: double-hung with white exterior trim and very light-green sash.

Walls: local quarry stone laid ordinary rubble with joints struck with trowel.

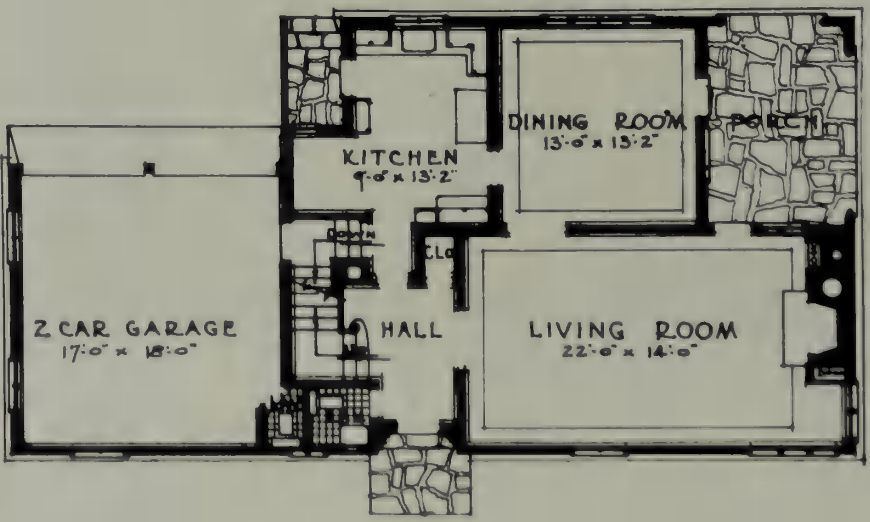
Cost per cu. ft.: about 46c.



HOUSE OF E. L. R. SMITH
GUILFORD, BALTIMORE
W. H. EMORY, JR., ARCHITECT



HOUSE OF MRS. J. WILLIAM LEWIS
RYE, NEW YORK
JULIUS GREGORY, ARCHITECT
J. WILLIAM LEWIS, LANDSCAPE ARCHITECT



Site: a level plot facing south with a brook at the rear.

Roof: shingles stained dark gray brown.

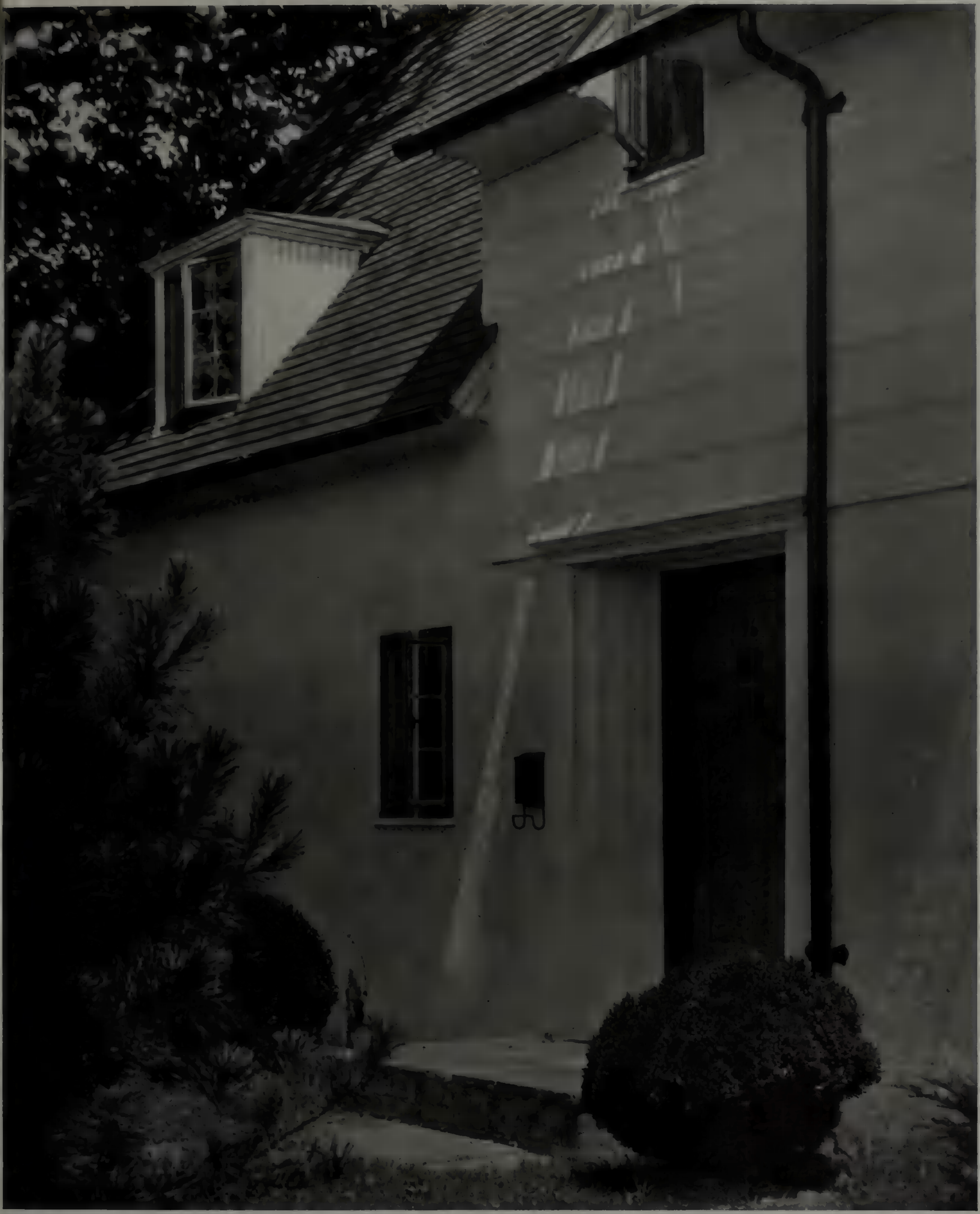
Chimney: white stucco.

Windows: steel casement, vertical glazing bars omitted.

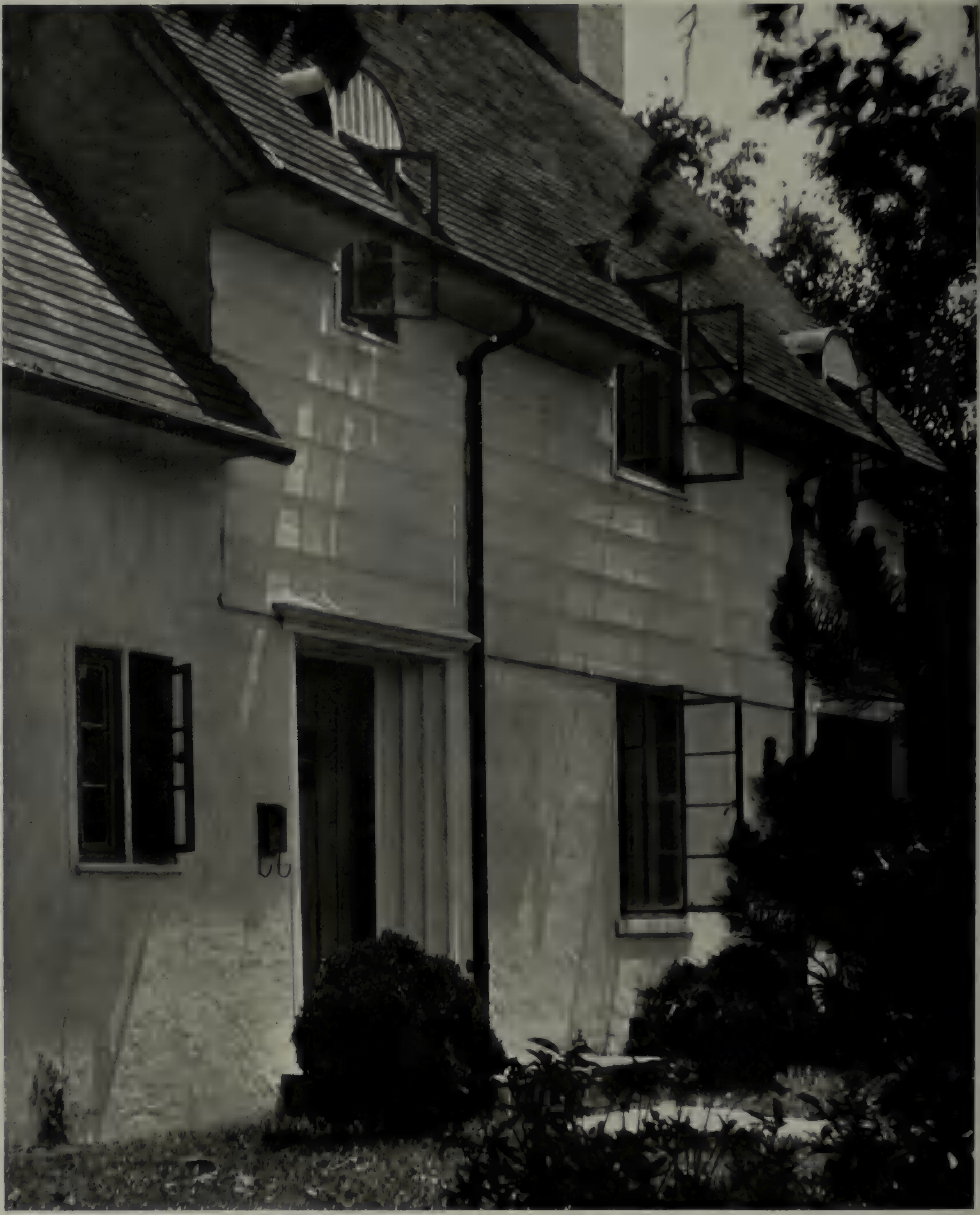
Walls: stucco on metal lath.

Cornices: stucco.

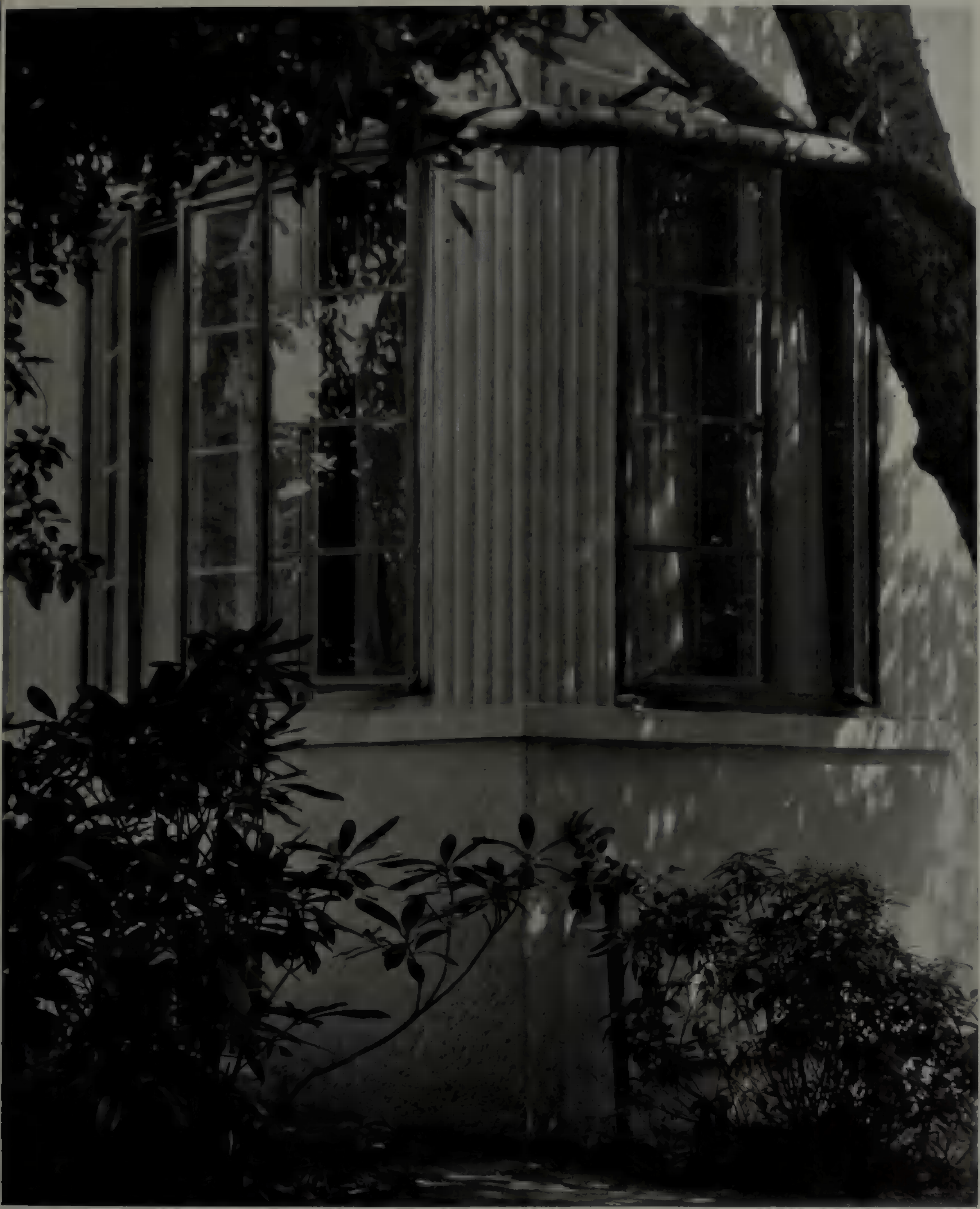
Color scheme: walls white; roof dark; sash warm gray.



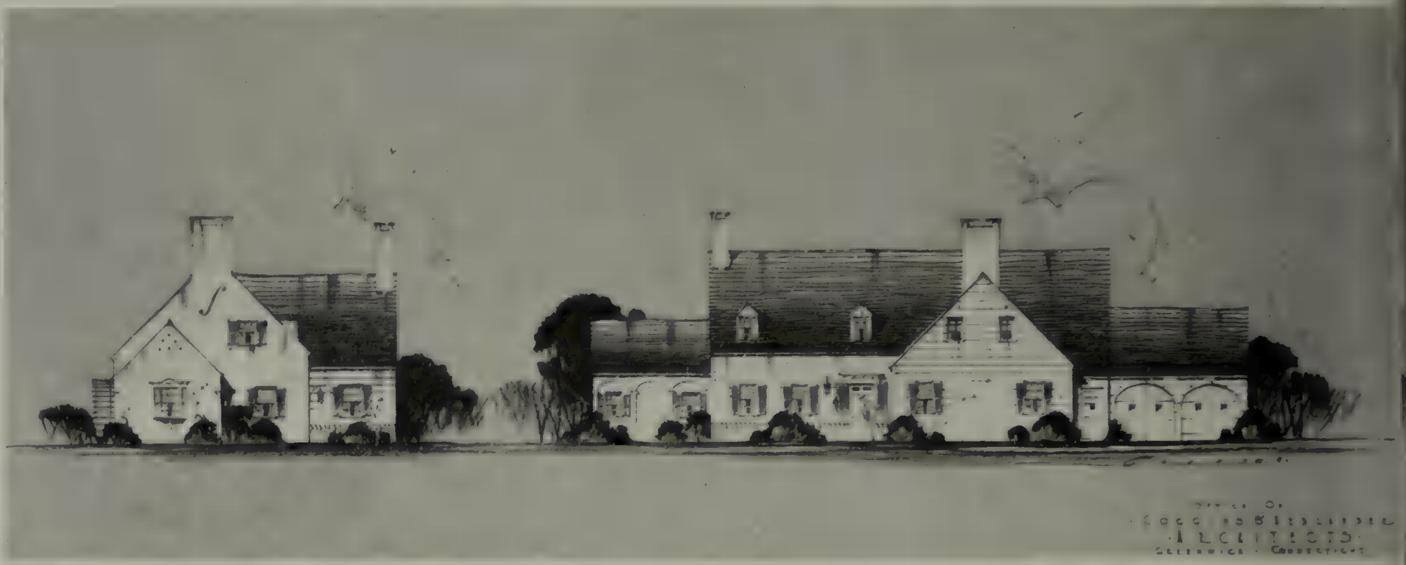
HOUSE OF MRS. J. WILLIAM LEWIS
RYE, NEW YORK
JULIUS GREGORY, ARCHITECT



HOUSE OF MRS. J. WILLIAM LEWIS
RYE, NEW YORK
JULIUS GREGORY, ARCHITECT

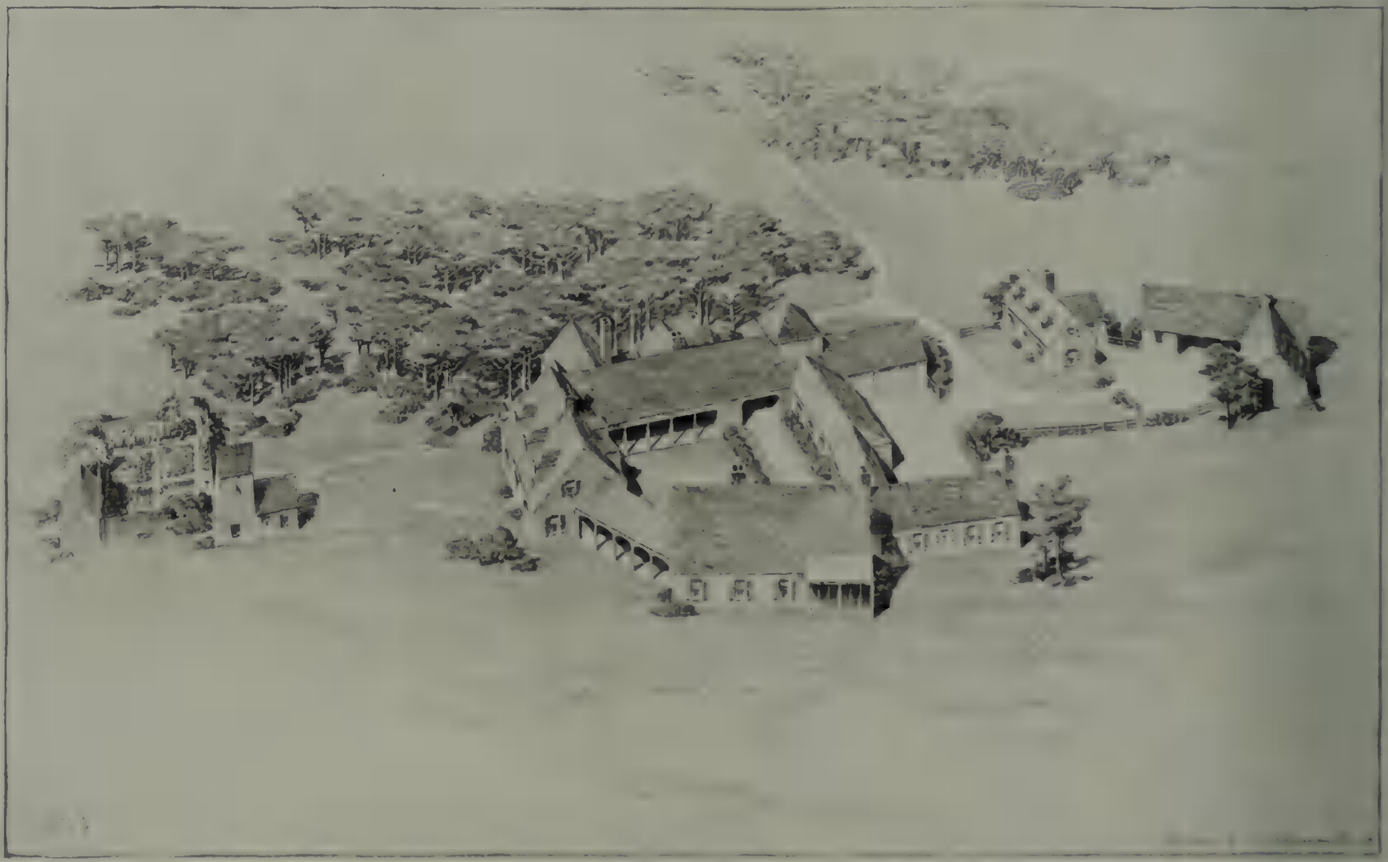


HOUSE OF MRS. J. WILLIAM LEWIS
RYE, NEW YORK
JULIUS GREGORY, ARCHITECT



Shannon

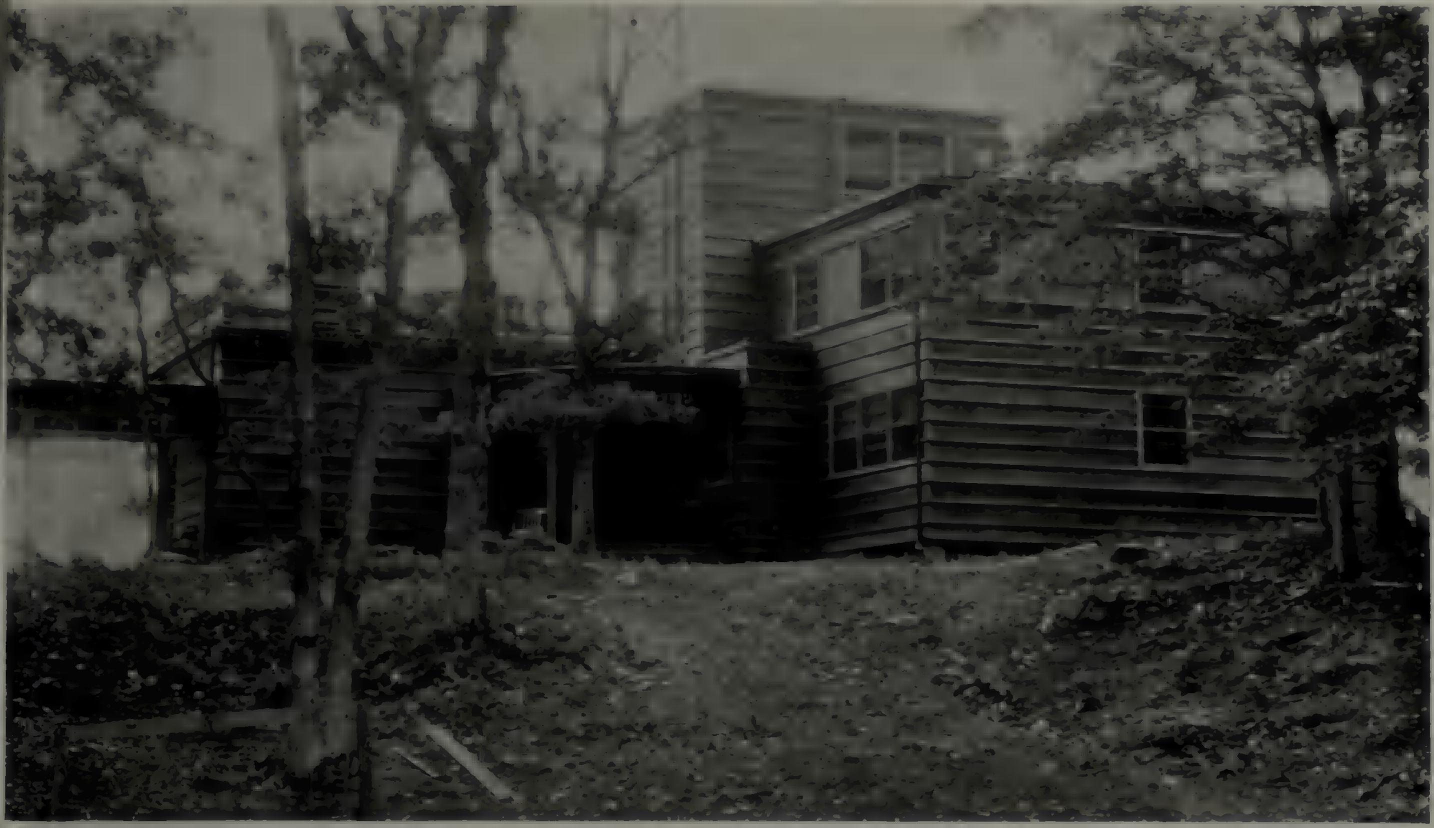
HOUSE DESIGN
COGGINS AND HEDLANDER, ARCHITECTS



Shannon

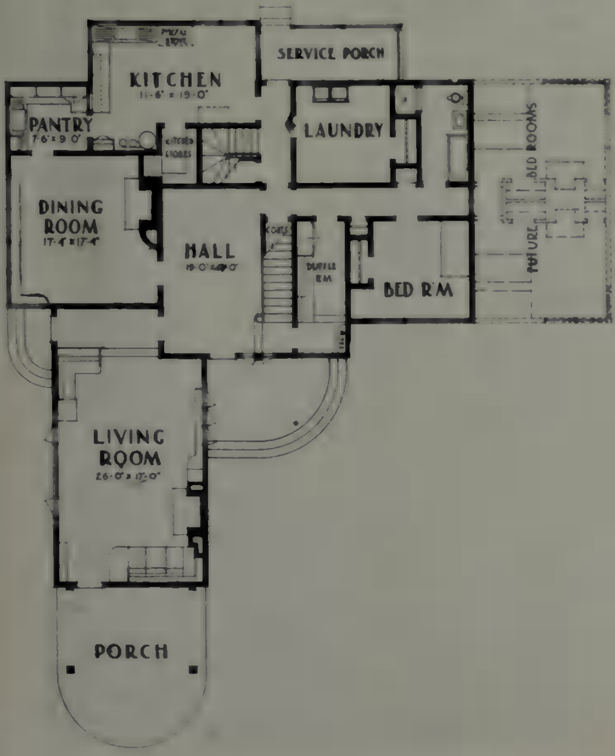
HOUSE FOR RANDOLPH PACK
NANTUCKET, MASS.
FREDERICK L. ACKERMAN, ARCHITECT

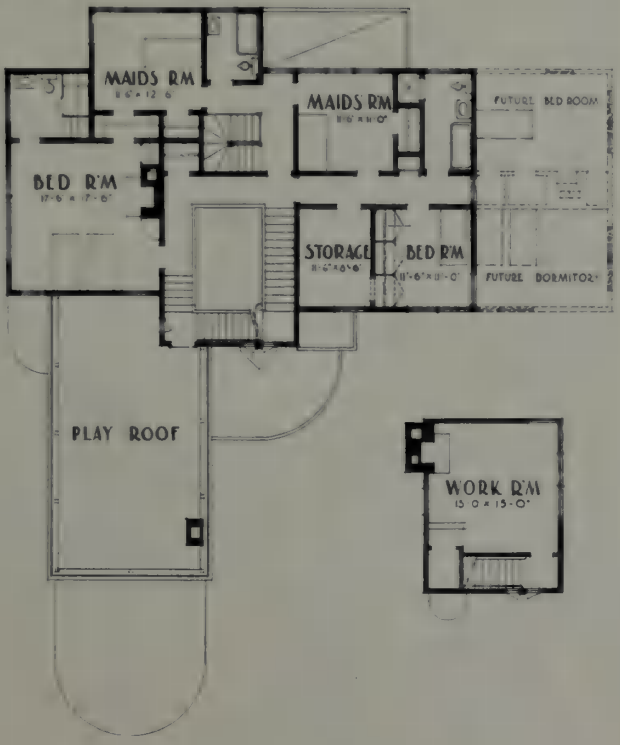
Courtyard provides shelter from breezes coming in over the moors. Walls and roof of hand-split shingles. Chimneys of brick. House designed primarily for summer use.

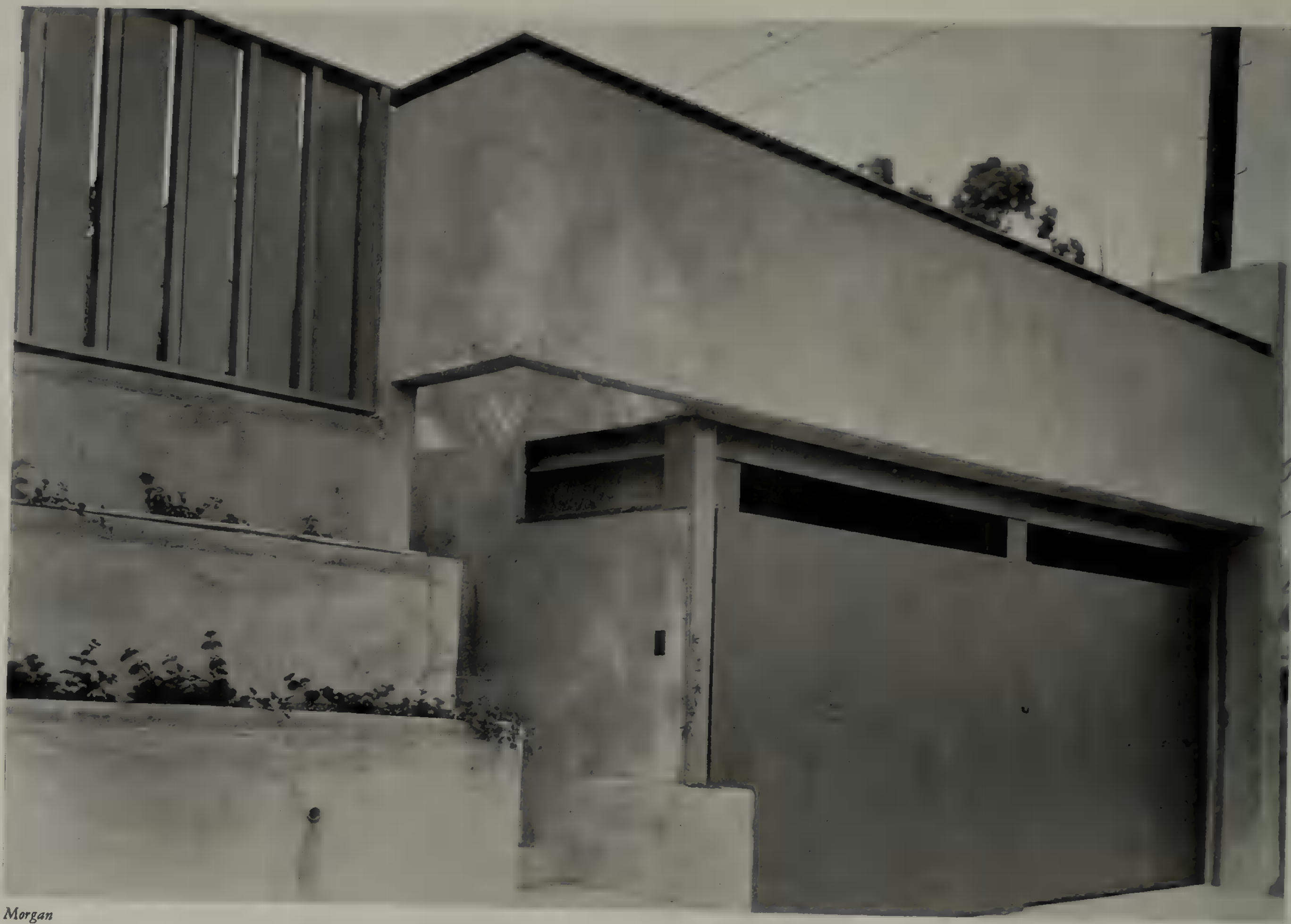


HOUSE OF G. LYMAN PAINE
NAUSHON ISLAND, WOODS HOLE, MASS.
J. C. B. MOORE, ARCHITECT

The house has no cellar. Exterior is made of 12" Redwood boards running horizontally, between which are rabbetted drip strips of cypress, all finished with oil and laid over 1" furring strips running vertically. These hold very heavy roofing paper in horizontal bands and provide air space. On the inside the walls are finished with ⅛" Solidon on insulation board ½" thick. This board is used on all the ceilings also, ½" thick on the first floor and 1" under the roofs. Under the roofs the ceilings slope with the rafters and are unplastered.

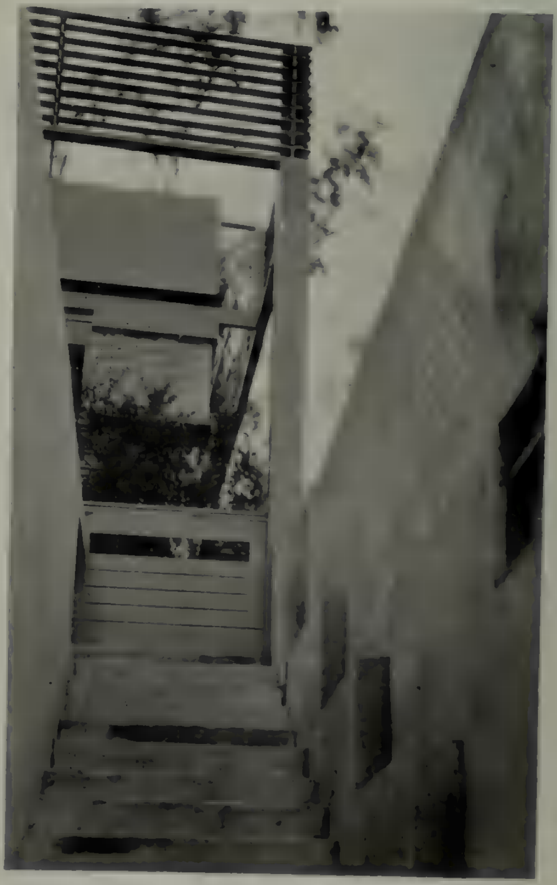


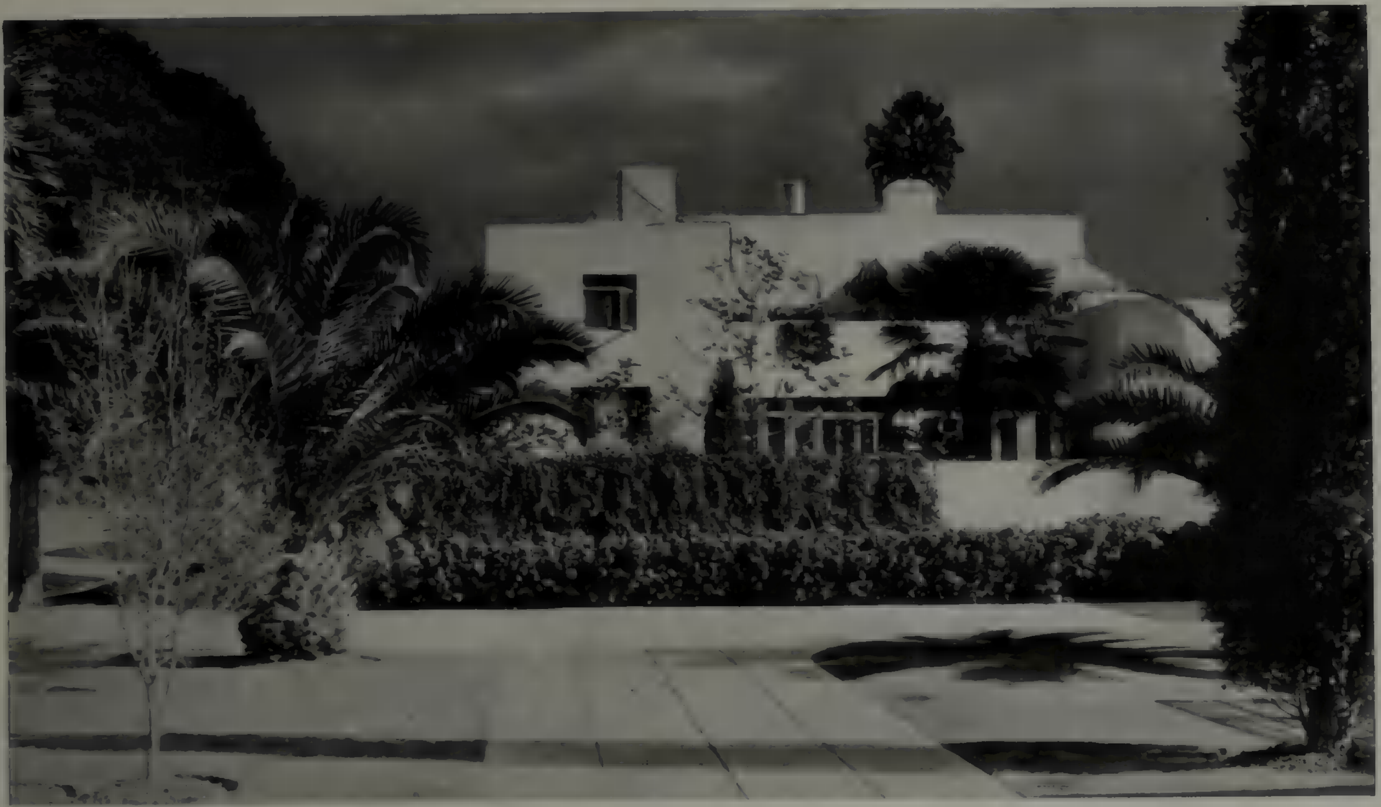




Morgan

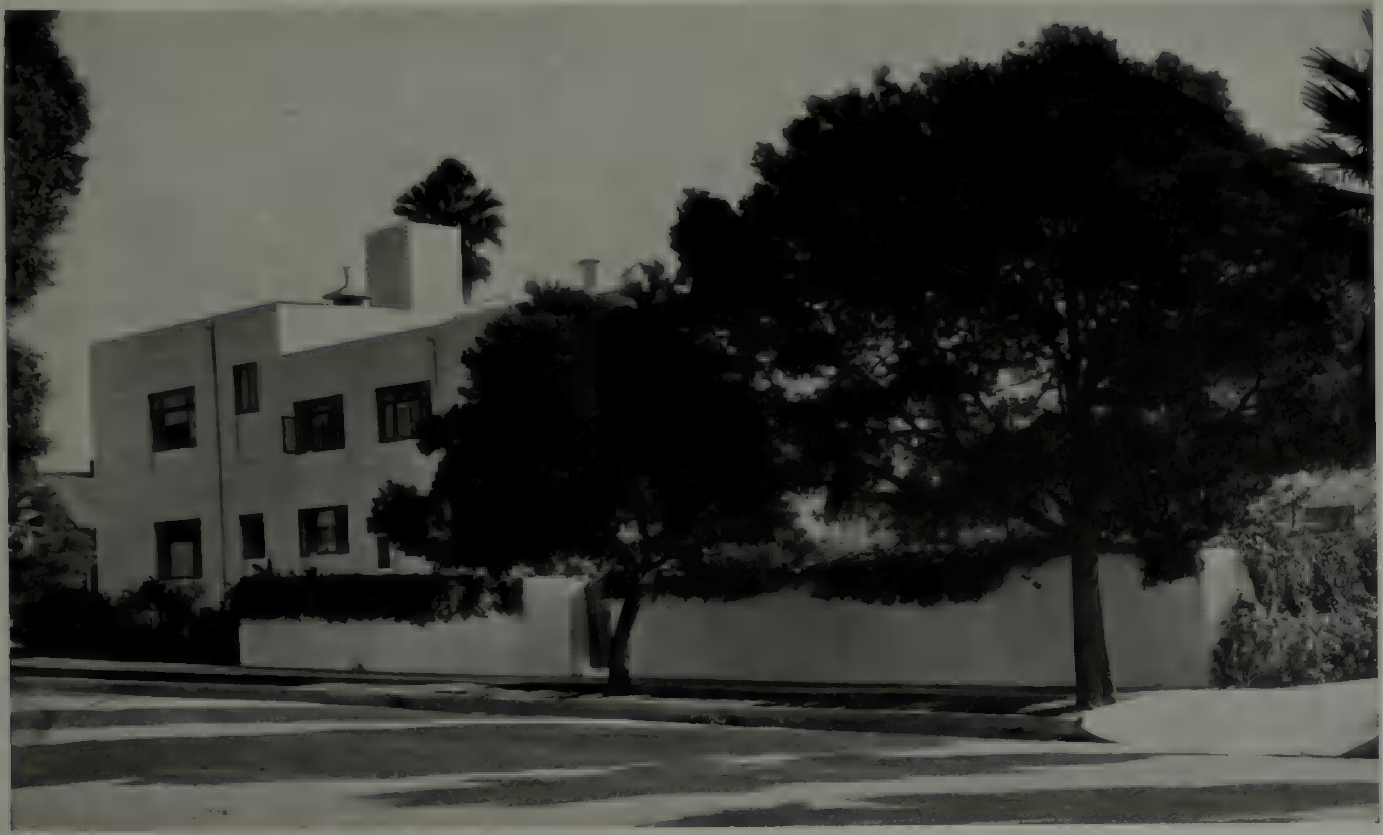
ENTRANCE
STUDIO OF CONRAD BUFF
LOS ANGELES
R. J. NEUTRA, ARCHITECT





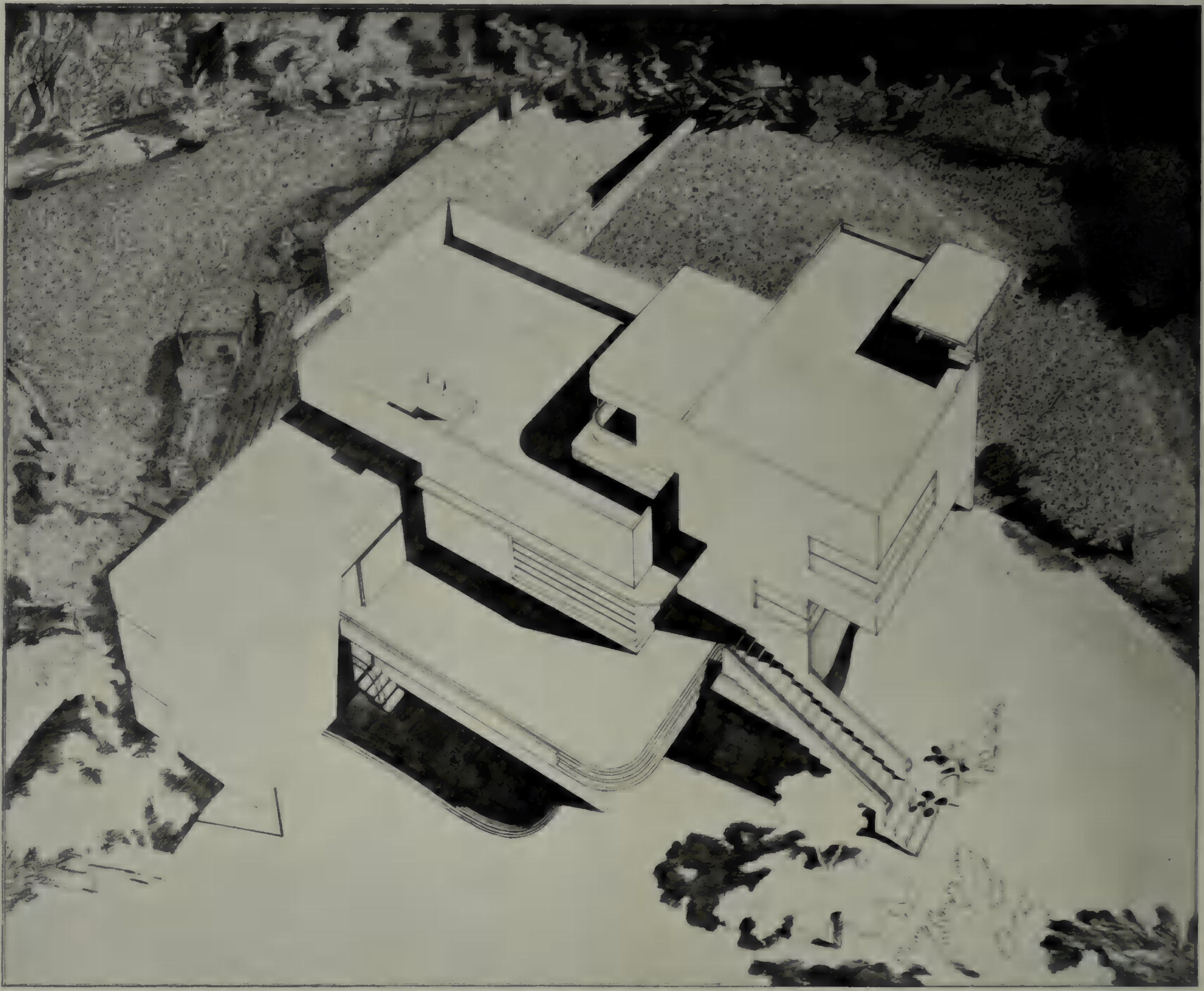
Morgan

Built in 1911



Morgan

HOUSE OF MARY BANNING
LOS ANGELES
IRVING GILL, ARCHITECT

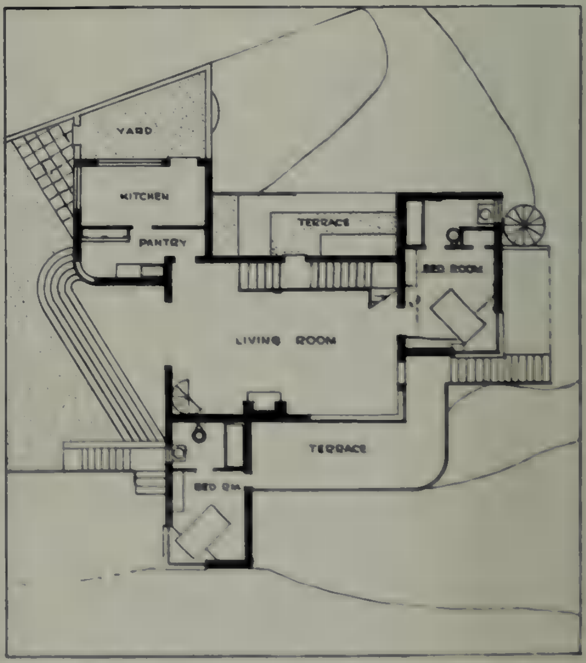


Palmer Shannon

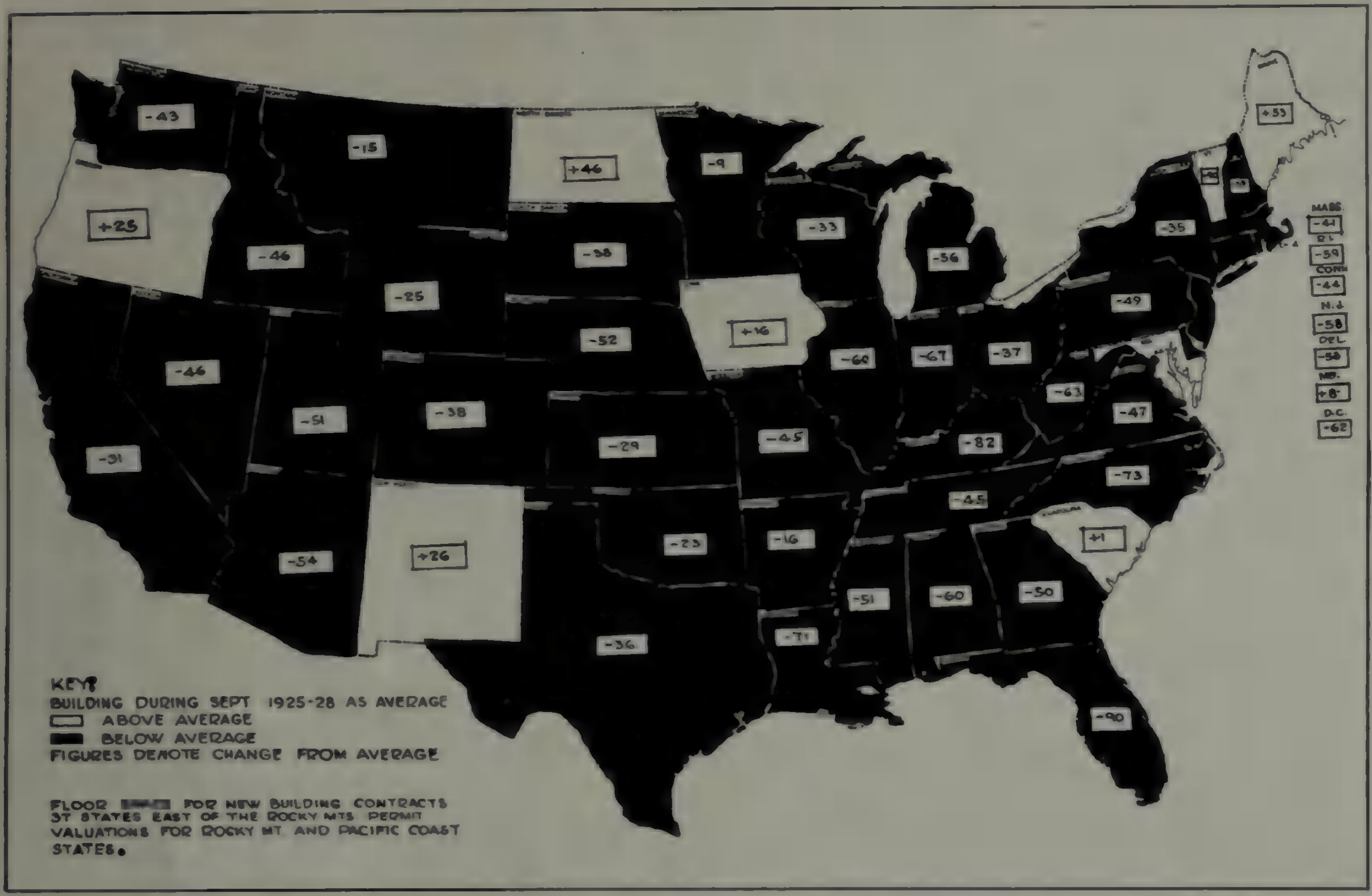
HOUSE FOR MRS. G. F. PORTER

OJAI, CALIF.

HOWE AND LESCAZE, ARCHITECTS



Building consists of steel frame carried by concrete piers and walls. Wall built of two 3″ thicknesses of masonry blocks, either tile or gypsum, with air space between stuccoed surface. Floors of light steel and concrete. Roof of gray flat tile. North and east walls, white; south and west, light blue; sash, dark blue; railing, white.



Though still spotty the September 1930 building map was more favorable than the August map. Eight states showed larger current new contract volumes than average (September 1925-1928); in August only five states showed new building above average.

BUILDING TRENDS AND OUTLOOK

ENGINEERING CONSTRUCTION AS IT RELATES TO BUILDING

The rapid progress in science and engineering during the past decade has wrought striking changes in our modes of living. Coincident with this transition, as much by cause as by effect, has come a remarkable development in the American skyline. Skyscrapers, residences, apartments, hotels, factories, schools are the more visible manifestations. But the broader consideration must count this development as only an incident in the processes that have made it possible. The septic tank, the clay road and the industrial smokestack are fast going the way of the coach and four while new engineering construction—power and lighting plants, sewerage and water systems, highways, bridges, and myriad lanes of communication—have opened up new fields for even further development in building modes.

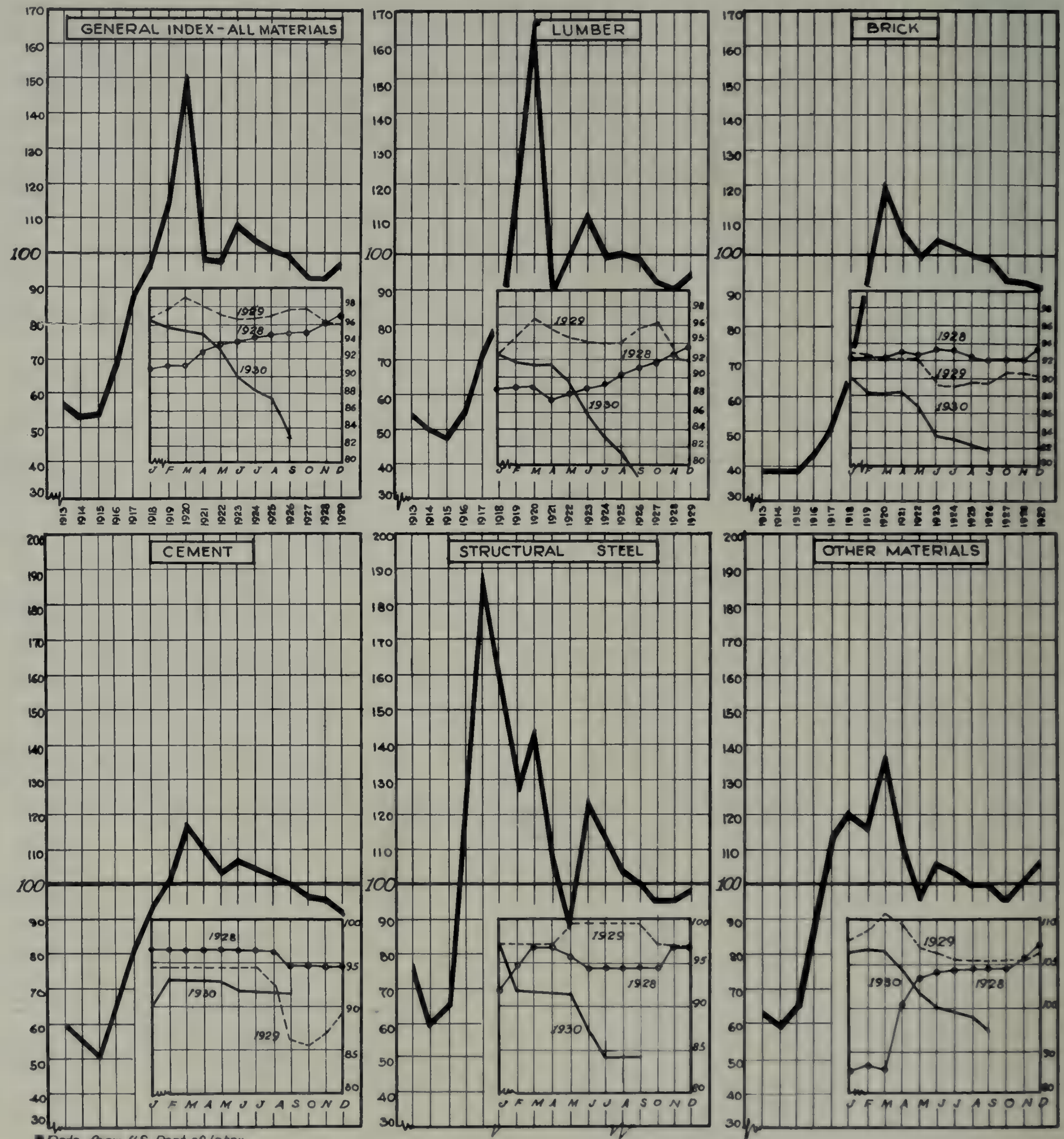
The automobile, the subdivision, intraurban population and business shifts, the electrification of industry—these and many other evidences of our rising living standards have put public authorities to the task of making further advances possible, while our privately owned utilities have methodically planned for this expansion and in this way are obtaining the rewards to which capital and initiative are justly entitled.

The construction of public works and utilities, despite all that has been said of them as a stabilizing influence to business, is still activated for the most part by conditions within the building industry itself and business conditions generally. During the period from 1919 to the end of 1929 public works and utilities representing new permanent improvements and extensions have contributed only 20 per cent to the total construction volume, with the remaining 80 per cent expended on building, both private and

(Continued [redacted] page 90, advertising section)

WHOLESALE PRICES FOR BUILDING MATERIALS

1926 monthly average = 100



*Data from U.S. Dept of Labor

Building material prices, as measured by the general index, moved downward further during September but showed only slight change during the early weeks of October. General commodity prices likewise declined in September with building material prices approaching the general commodity index. Labor cost indexes still fail to register any perceptible declines, though the General Building Contractor index disclosed for September the first movement in months, which in this case was downward. In the meantime, money is plentiful and continues to accumulate. With increasing activity in residential building, particularly apartments, which has recently manifested itself, it would appear that conditions making for revival in this branch of the industry are growing more favorable.

SCHOOL LIFE...

is hard on Paint...

Interiors at the Camden County Vocational School, Camden, N. J., are handsome, well lighted, spotlessly clean. And lastingly so, for the building is painted throughout with Barreled Sunlight.

. . .

Architects:
Lackey and Hettel,
Camden, N. J.

REGULAR classes by day . . . adult classes by night . . . basketball and dancing in the gym . . . the modern school plant has come to occupy an important position in community life.

Proper maintenance of buildings and equipment grows constantly more difficult. One problem, however, has ceased to worry many architects, school authorities.

In hundreds of communities, the satisfactory upkeep of painted interiors has been entrusted to Barreled Sunlight.

Conspicuously good looking . . . surprisingly resistant to dirt and to yellowing . . . readily washable . . . contributing materially to efficient working light . . . easily tinted any desired shade . . . Barreled Sunlight combines to an unusual degree the qualities essential to efficient, economical service in the modern school building.

For an interesting booklet, a sample panel, mail the coupon. (See our catalog in Sweets.)

U. S. Gutta Percha Paint Co., 22-K Dudley Street, Providence, R. I. Branches or distributors in all principal cities.

Easy to Tint

Barreled Sunlight is readily tinted any desired shade with ordinary colors in oil. Quantities of 5 gallons or over are tinted to order at the factory without extra charge.

U. S. GUTTA PERCHA PAINT CO.
22-K Dudley Street, Providence, R. I.

Please send me your descriptive booklet, and a panel painted with Barreled Sunlight. I am interested in the finish checked here:
Gloss ( ) Semi-Gloss ( ) Flat ( )

Name.......................................

Street.......................................

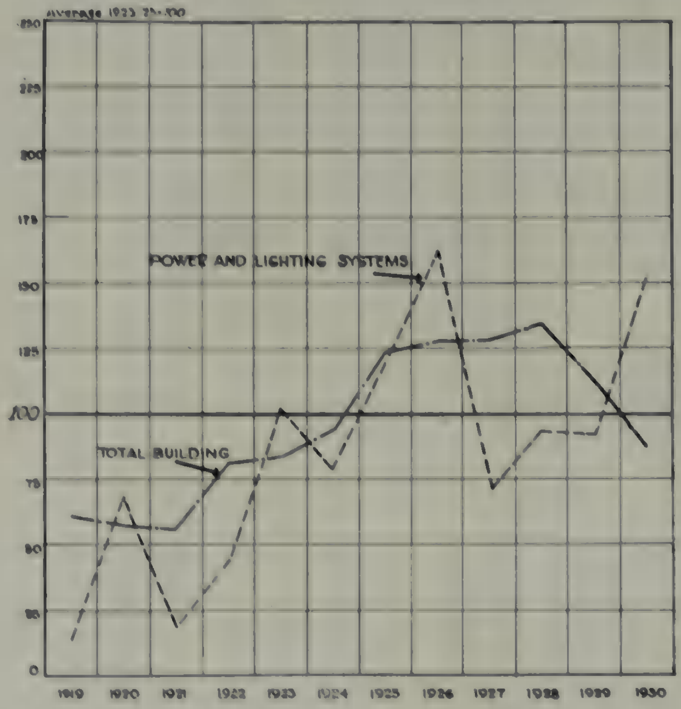
City.......................State..........

Barreled Sunlight

Reg. U. S. Pat. Off.

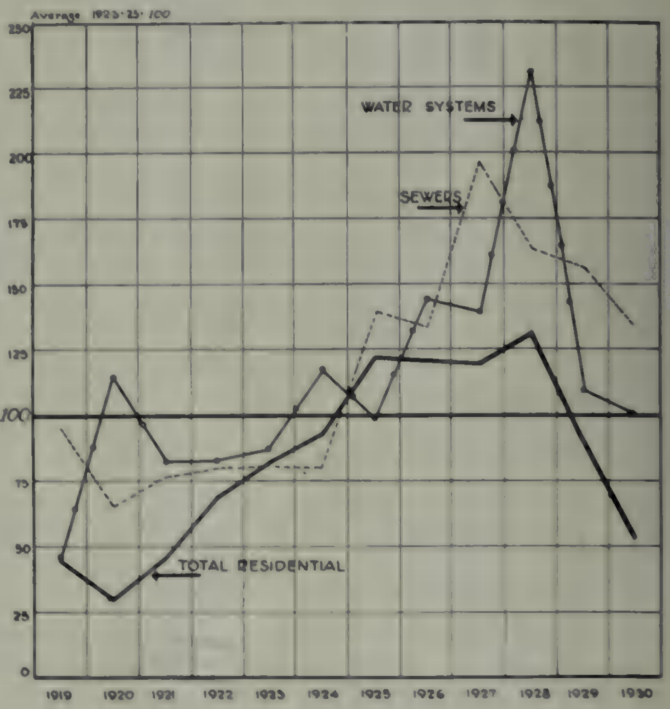
BUILDING IN 27 NORTHEASTERN STATES: 1919-1930

A comparison with typical classes of public utilities; 1930 partly estimated.



BUILDING AND
POWER AND LIGHT SYSTEMS

Expenditures for new power and lighting systems over the past few years have paralleled more closely than any other class of public or quasi-public construction the trend in expenditures for new buildings of all types.



RESIDENTIAL BUILDING AND
SEWERAGE AND WATER SYSTEMS

Under stimulus of easy money, rising realty values and larger tax levies, our state and municipal governments have apparently expanded their expenditures on sewerage and water systems beyond what now appears to have been the economic demand.

(*Continued from page 442, editorial section*)

public. None the less, were a sudden halt called in all engineering works the building industry, as we know it now and this goes for our living standards, would soon become decadent, for there is no branch of building which does not derive new life from the arteries of communication, power, light, sewerage and water systems.

Some types of public works and utilities are more readily attuned to building conditions than are others. The line of distinction seems to be one of ownership. Those undertaken by public authorities with public moneys show the lesser relationship, though indeed there is some, while utilities construction financed by private capital shows the greater relationship to building and underlying business conditions.

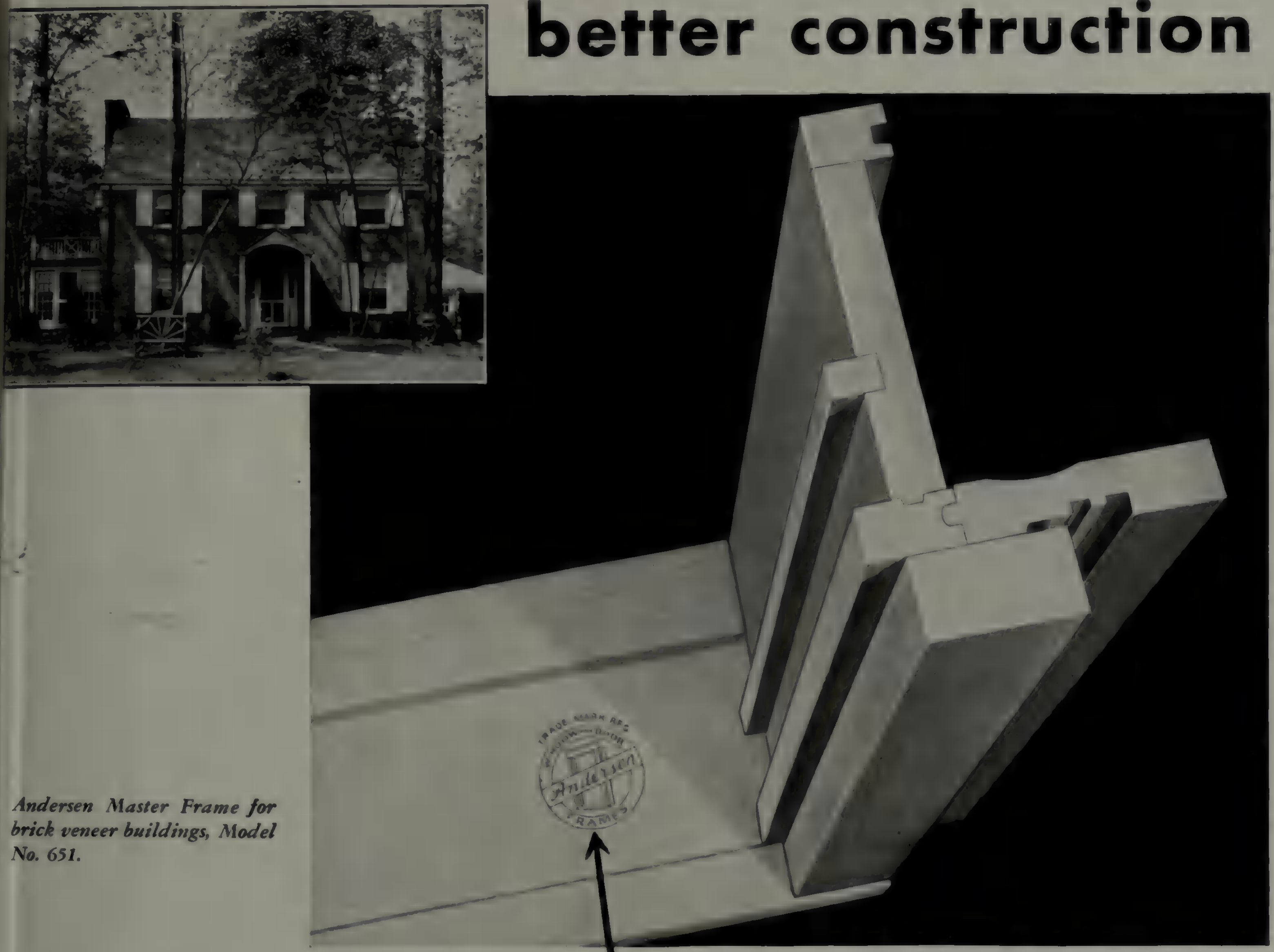
Thus expenditures for highways, which over the past decade have accounted for about 50 per cent of all public works and utilities, have moved rather independent of conditions peculiar to building, though even here, without larger and ever larger diffusion of automobile ownership and the attendant traffic problems, subdivisions and suburban realty developments could hardly have been possible on the scale of the past decade.

All remaining engineering construction over the period under review contributed only about 10 per cent of the total expenditure for construction, inclusive of building. Thus it may be seen that railway construction including buildings, bridges, power and lighting systems, sewerage and water systems and water front developments, have had only small influence in the total volume of new construction. But their effects upon building far exceed this indicated small relationship.

Sewerage disposal and water systems, like highways, are principally undertaken by public authority, while railway construction and power and lighting systems are almost entirely privately owned. Expenditures for sewerage disposal and water systems over the past decade have, it would appear, far outrun the demands of new building. Taking the years 1923 to 1925 as a basing point, water systems ranged from 45 for 1919 to an index well above 225 in 1928, the peak building year, though residential building in the same period showed a low point of about 30 for 1920 and a high point of only about 130 for 1928.

Sewerage systems over the same period ranged from a low of about 65 for 1920 to a high of about 195 for 1927. Water systems declined sharply in 1929 and 1930 while the decline in sewer systems, though less

Architects turn to this new frame with locked sill-joint for better construction



Andersen Master Frame for brick veneer buildings, Model No. 651.

To get greater building value, per every dollar invested, architects today are turning more and more to the new Andersen Master Frame with the new locked sill-joint construction.

Now they get real custom frame value at stock frame price—plus a big saving in labor costs—with Andersen Master Frames.

They appreciate the genuine white pine, the chamfered blind stop, the steep sill slope, the inside liner, the noiseless pulleys—the many other exclusive Andersen features.

You should learn about the new Andersen Master Frames—made to fit your most rigid specifications. Write today for your copy of our new Andersen Master Frame catalog, No. 500.

ANDERSEN FRAME CORPORATION, Bayport, Minn., represented by three thousand five hundred leading jobbers and dealers.

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FOR WEATHERTIGHT INSTALLATIONS—USE ANDERSEN SPECIFICATIONS

drastic, has continued since 1927. The record discloses that during the first half of the period beginning 1919 both water and sewerage systems pretty much paralleled residential building. But for the latter half of the period, under the stimulus of easy money, rising realty values and larger tax levies our state and municipal governments expanded their expenditures on these items beyond what seems now to have been the economic demand. As a matter of fact it may now be said that new residential building had, during the years since 1924, been carried on in a volume in excess of our ability to consume housing, in the light of which the excess construction of sewerage and water systems, particularly in suburban areas, has placed an even heavier burden upon real estate from the investment standpoint. What is said of sewerage and water holds for all other engineering construction under governmental authority. As a result of this our taxing authorities have more or less arbitrarily had to increase realty assessments to provide the needed taxes to retire the indebtedness which this expansion has incurred.

It would appear that this condition presents a real problem to planning commissions, architects and real estate boards, since it may develop as an important limiting factor on new building by private funds.

Where building is financed principally by private funds engineering works are entirely financed by public moneys, present and in prospect, and private capital willing to submit to public supervision.

Expenditures for new power and lighting systems over the past few years paralleled more closely than any other class of public or quasi-public construction the trend in expenditures for new building. Though there have been periods when one or the other was on a higher plane, in general their lines of growth over the past eleven years have been strikingly similar. This is more than accidental. These utility types for the most part are owned by private capital. Their engineers are charged with the task of showing earnings on capital and in this must survey the needs arising out of changing trends in population, housing, shifts in commercial and industrial sections. Conduits, cables, trunk lines—these are part of capital which must bring dividends and pay bond interest even under the limitations of public supervision.

Some considerable time naturally elapses before plant extensions and enlargements can show earnings; so much more, then, is it necessary for the utility companies to anticipate future needs correctly. And this, in the past decade, they seem to have done well. That power plant extensions and enlargements of lighting systems have shown consistent growth since 1926 even in the face of our present depressed building and business conditions is nothing more, it would appear, than a recognition that the long-term demands are still rising and that no time is more propitious for the development of our privately owned utilities than a period of depression when commodity markets, labor conditions and money rates are favorable to economic expansion.

The electrification of industry and the growing use of natural gas in the arts are eliminating the industrial smoke nuisance and providing a greater opportunity for architectural directness in the design of our industrial plants. In this process our factory buildings in many instances are becoming obsolete, and in the rehabilitation which seems likely, because of the relative ease in money and construction costs, American industry may be on the eve of large building activity in which the alert architect will play an increasingly important role.

New architect-planned industrial plants undertaken during the first nine months of 1930 showed a loss of only 25 per cent from the corresponding period of 1929. At the same time, engineer-planned factories which are the more important, showed a loss from 1929 amounting to 32 per cent. As a matter of further interest in this connection all architect-planned non-residential building during the first nine months of 1930 declined only 12 per cent from the corresponding nine months of 1929, while non-residential building planned by engineers or undertaken from private plans showed a loss of 30 per cent.

In the meantime it is becoming increasingly clear that the stimulus to construction and business generally which has been feebly provided by large public works construction is abating. It is indeed of large significance that the record-breaking awards for public works and utilities for the first nine months of 1930 have been almost entirely due to such undertakings by private capital, principally for the erection of pipe lines and power plant extensions, but for which even engineering would now be running behind 1929.

Quite naturally there are limits to the taxing powers of our states and municipalities. Even the Federal Government, which derives its revenues principally on earned incomes under our present system of taxation, is faced with lower revenues for 1931 in the light of the depressed business conditions of 1930. Then, too, public debt limits of most of our states and municipalities have been either reached or are uncomfortably close.

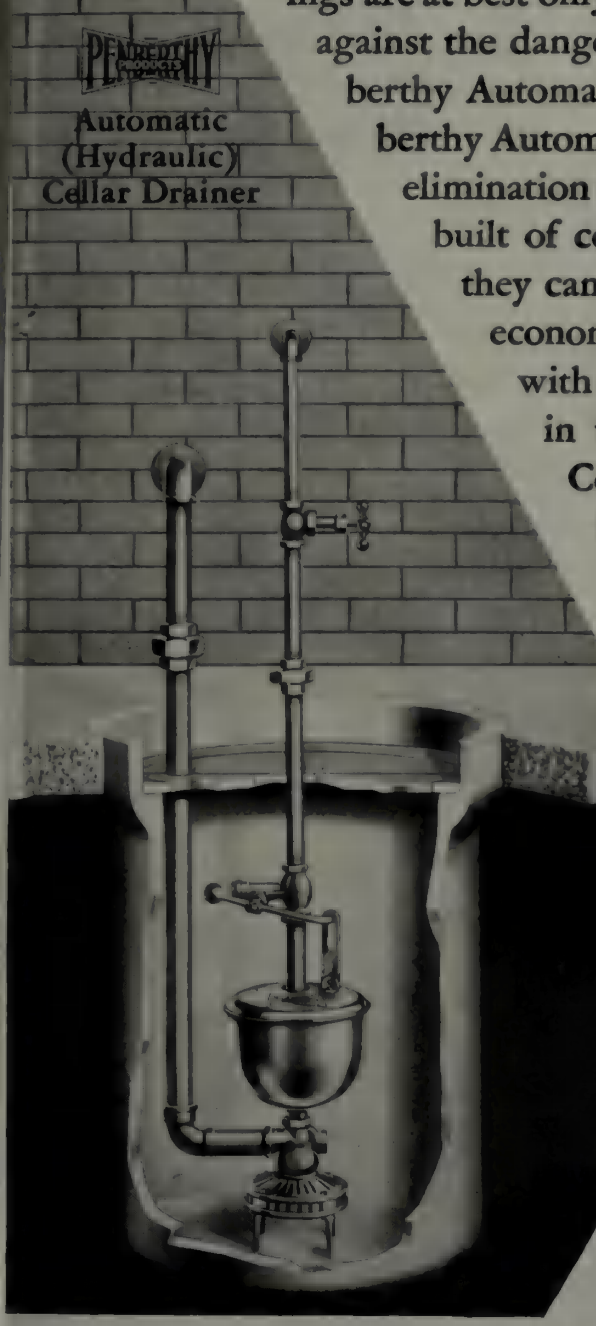
Thus the relationship between building and engineering construction is of large importance, with a need for closer gearing of publicly owned projects to building demands. To burden land with taxes for public improvements, however meritorious, for which no present reasonable economic need exists seems to offer an obstacle—though by no means the only one—in the way of early restoration of large new-building activity, which of necessity must proceed from a fundamentally sounder basis than has attended the large activity that was so abruptly brought to a close months ago.

L. Seth Schnitman

the Pumps that *Cannot Rust*

Rust, the eternal enemy of iron and steel, is ever alert for the attack whenever these metals are exposed to water, and protective coatings are at best only a partial defense. ¶ Positive protection against the danger of rust has been achieved in the Penberthy Automatic Electric Sump Pump and the Penberthy Automatic Cellar Drainer, by the complete elimination of iron and steel. These pumps are built of copper and bronze throughout — they cannot rust. ¶ Dependability and economy of operation are consistent with the quality of materials used in the Penberthy Automatic Cellar Drainer and the Penberthy Automatic Electric Sump Pump.

Both types are carried in stock by leading jobbers throughout the country



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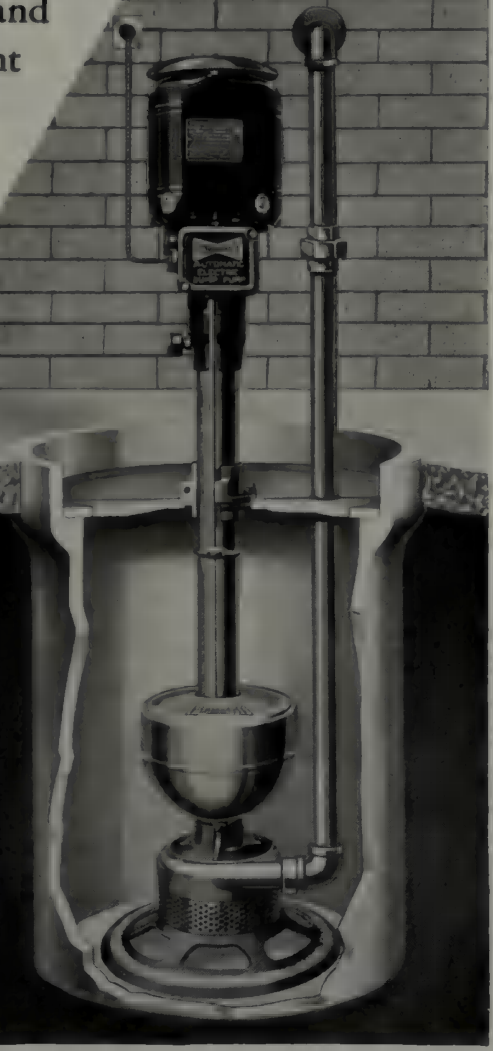
Automatic (Hydraulic) Cellar Drainer



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WESTERN UNION DIDN'T GUES
- - - THEY *TESTED* FLOOR MATERIAL

Covering an entire block, and rising to a height of 400 feet, this new Western Union Building is a noteworthy addition to the New York City skyline. The Bonded Floors of *Sealex* Treadlite Tile were installed in this building by Rollo, Johnson and Seidler, Authorized Contractors of Bonded Floors.

WHEN WESTERN UNION officials decided to erect i New York City the largest central telegrap office in the world they were confronted with a floo ing problem of unusual complexity. Operating roo floors—with a 24 hour working day—required material which could withstand extreme wear, abso a minimum of light and a maximum of sound, lowest maintenance and repair cost.

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Write Department F. for details of our natio wide installation service.

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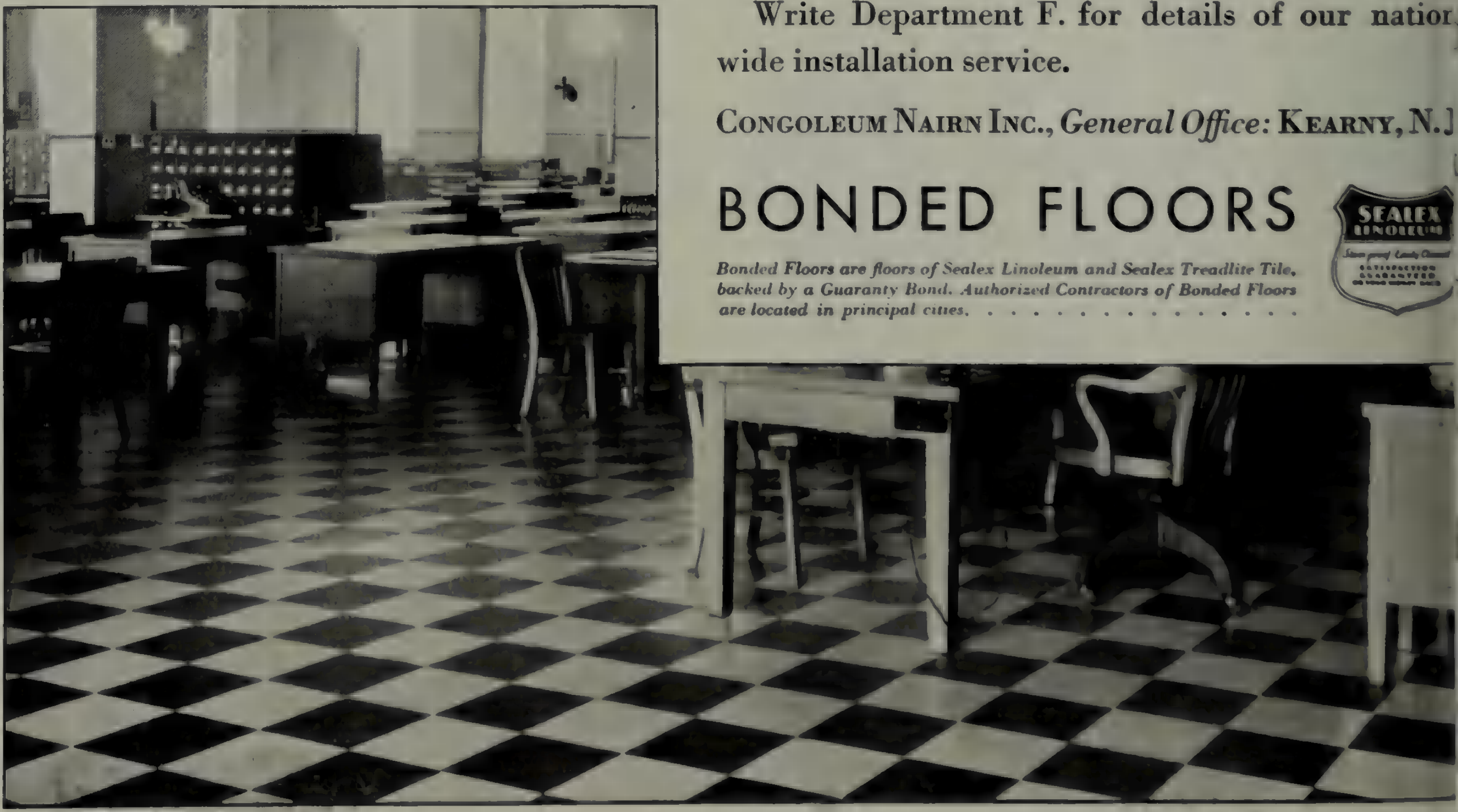
Bonded Floors are floors of Sealex Linoleum and Sealex Treadlite Tile, backed by a Guaranty Bond. Authorized Contractors of Bonded Floors are located in principal cities. . . . .



GOOD BUILDINGS DESERVE GOOD HARDWARE

The Carew Tower in Cincinnati is a new example of the type of business structure for which Corbin Hardware is specified.

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The American Hardware Corp., Successor
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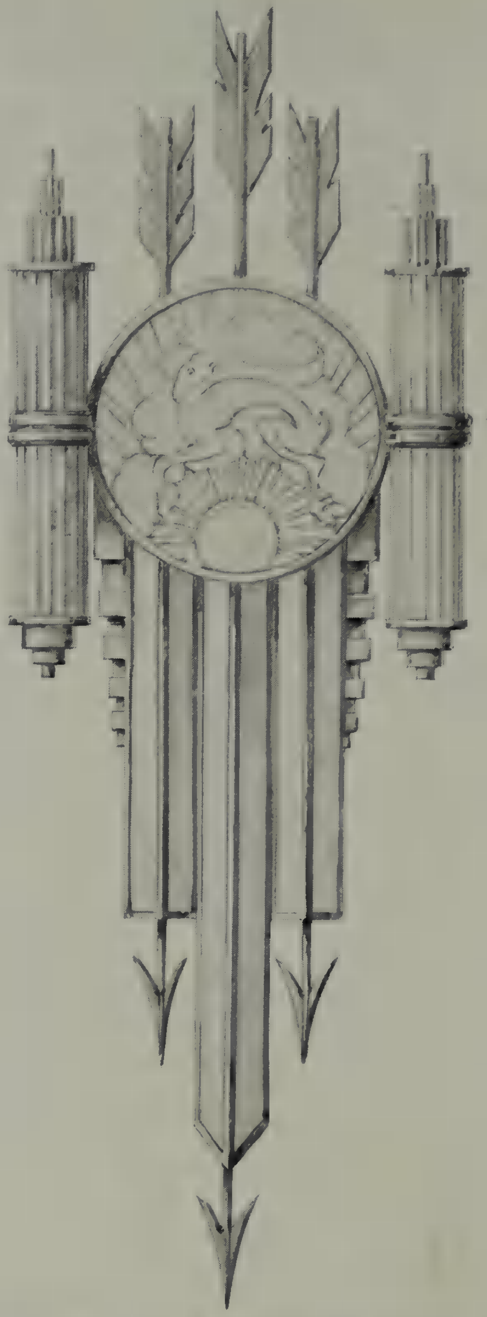
The CAREW TOWER, CINCINNATI, OHIO

Architect	Walter Ahlschlager, Chicago
Associate Architects	Delano & Aldrich, New York
Contractors	Starrett Building Company, Chicago
Hardware	P. & F. Corbin



Exterior Bracket in Benedict Metal and Carved Glass for Powhatan Apartments—Chicago—Robert S. DeGolyer, Architect

DISTINCTIVE

■ ■ ■ A lighting fixture—by PEARLMAN—in Modern American Indian Design to harmonize with a distinctive type of structure.

All of our facilities are available to the architectural profession for research and consultation. Ask us to send you our series of Lighting Studies in plate form as they appear—no obligation of course. » » »

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Chastleton Apartment Hotel, Washington, D. C. 7000 gallon storage tank in this building is kept full of hot water by Excelso Indirect Heaters.

PIPING HOT WATER IN 500 ROOMS

at Practically No Cost

Excelso Indirect Water Heaters supply the hot water needs of the occupants of the 500 rooms in this fine new apartment hotel in Washington, D. C. These heaters operate at practically no cost, working in conjunction with the steam heating boilers in the building, keeping a 7000 gallon storage tank continually full of piping hot water.

This installation is just one example of the satisfaction being given by over 700,000 Excelso Indirect Water Heaters throughout the United States and Canada. They work just as effectively in apartments of this size—in hotels, office buildings and factories—or in residences large or small. There is a size Excelso to solve any hot water supply problem.

An Excelso Indirect Water Heater can be used on any steam or vapor heating boiler, and operates continuously, without care or attention, as long as the boiler is being fired.

Ask your Plumber or write direct for the complete Excelso story.

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Sold and Installed by Leading Plumbing and Heating Contractors Everywhere.

Excelso Water Heaters are made in single, double, triple and dual coil types. Seventeen sizes offer a tank capacity range of [illegible] to 2000 gallons. Greater capacities can be cared for by installation in battery.

Left:—
Triple coil Heater with cover plate removed, showing the removable copper coil and patented ground joint brass connections. Made in 600 to 800 gallon capacities.

EXCELSO INDIRECT WATER HEATERS

SIZES FOR ONE FAMILY TO 100

"KOHLER FIXTURES
increase confidence of prospective purchasers . . . win instantaneous approval!"

A BUYER'S market existed in Iowa. A surplus of homes made new building risky. The Ferguson Realty Company, progressive builders of Des Moines, undertook a survey of the housing situation, and decided to beat competition solely with better construction. Hardware, tilework, lighting, trim and decoration were of the highest quality. *And Kohler installations throughout, in color!* . . . Ninety-seven lots sold. Fifty-seven with built-to-order homes!

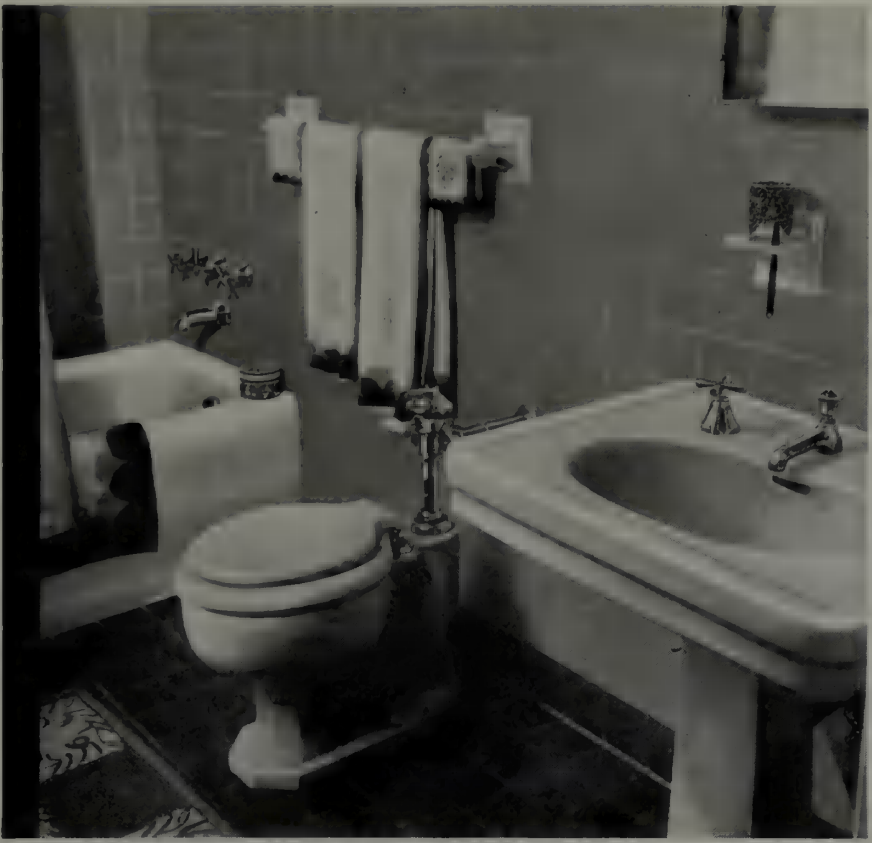
"The results were very gratifying," writes Oscar L. Powell, member of the firm. "Kohler plumbing fixtures met with instantaneous approval of prospective buyers, and speeded up rentals. *We are firm in the belief that Kohler fixtures increase confidence of prospective purchasers, and add a margin of safety to speculative projects.*

"During the last five years we have used Kohler fixtures exclusively, installing them on over 350 jobs, and we have never had a defective fixture, or any complaint of any kind to make. That is truly a remarkable record, and evidence of the high standards and uniformity of manufacture of the Kohler Co. . . . We prefer Kohler's pastel colors, which can be easily taken into a harmonious color scheme without increased work or worry.

"Last, but not least, we have found Kohler representatives capable to lend sound advice and ever ready to co-operate!"

Satisfaction with the bathroom usually means satisfaction with the rest of the house. Graceful in design, pleasing in color, soundly constructed, the quality of these fixtures goes straight through to all the hidden particulars that mean efficiency, safety, permanence. Remember that Kohler fixtures deserve Kohler fittings. . . . Kohler Co. *Founded* 1873. Kohler, Wis.—*Shipping Point,* Sheboygan, Wis.—*Branches in principal cities.* . . . Look for the Kohler trade-mark on each fixture and fitting.

All-Kohler color installations — the operation of the J. C. Ferguson Realty Co., Des Moines, Ia., owners and builders. Guy McDowell, Des Moines, architect. Landis Plumbing Co., Des Moines plumbers. Beckman Bros., Des Moines, jobbers.



VICEROY *bath.* STANDISH *vitreous china lavatory.* PENRYN *closet with* TAUNTON *seat. Fittings in the distinguished Octachrome pattern, chromium plated.*

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BIG JOBS

Check your requirements against MacArthur qualifications:

Product	*proven*
Experience	*20 years*
Equipment	*latest*
Resources	*unlimited*
Personnel	*capable*
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NATIONAL TUBE CO. PLANT, McKeesport, Pa.
John F. Casey Co., *General Contractors*
George E. Sperling, Chief Engineer of Construction, National Tube Co.
6000 piles (230,616 linear feet) completed in 89 driving days.

MILWAUKEE COUNTY COURT HOUSE, Milwaukee, Wis.
Albert R. Ross, *Architect*
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AMERICAN ENKA CORPORATION, Asheville, N. C.
The H. K. Ferguson Co., *Engineers and General Contractors*
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GOODYEAR-ZEPPELIN CORP. AIRSHIP FACTORY AND DOCK, Akron, Ohio
Wilbur Watson and Associates, *Architects and Engineers*
1244 piles (25,776 linear feet) completed 50 driving days.

CANADIAN PACIFIC RAILROAD HIGH LEVEL TERMINAL, Toronto, Canada
Anglin-Norcross, Limited, *Engineers*
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STATE OF OHIO AND CITY OF CINCINNATI WEST EIGHTH STREET VIADUCT, Cincinnati, Ohio
J. R. Burkey, *Chief Engineer Bureau of Bridges*
E. A. Gast, Hamilton Co., *Surveyor*
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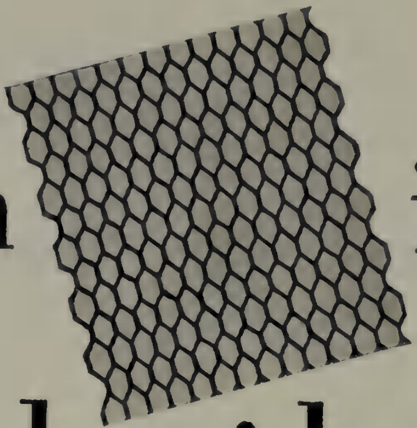

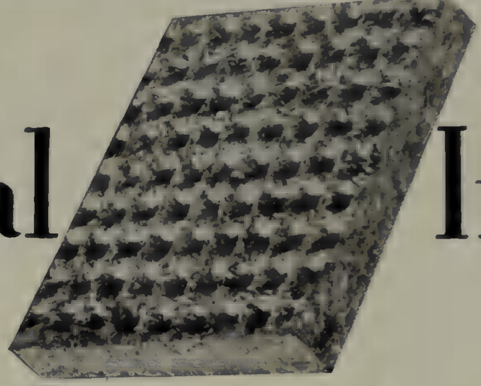

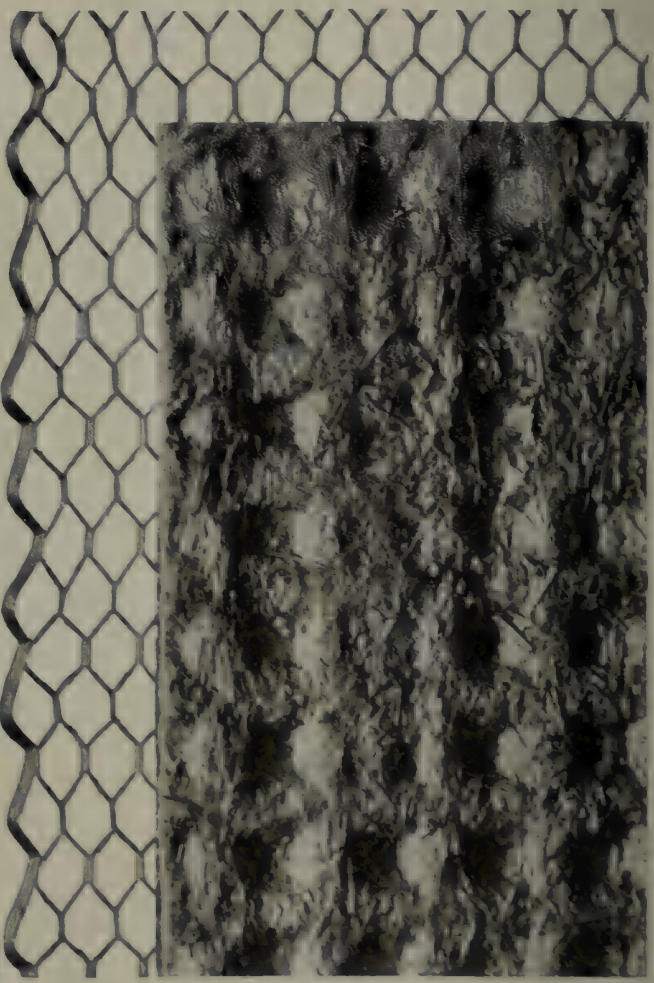

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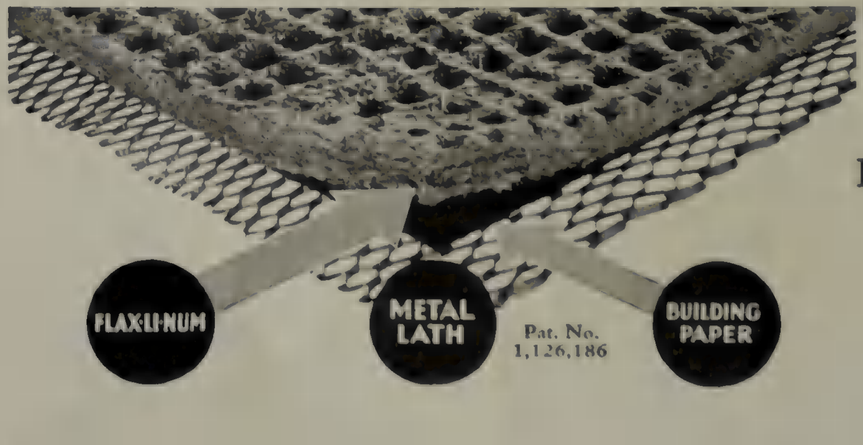

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This beautiful structure is "Modernistic" in design with a plant section containing some of the largest printing presses in the world. Above the ground floor there are 36 stories of offices, all with outside exposure.

Like so many of the country's outstanding architectural achievements, "The News" building is equipped with Russwin Hardware—specified by leading architects because of its durability, distinctive beauty of design and the life-time of trouble-free service that it gives. Russell & Erwin Manufacturing Company (The American Hardware Corporation, Successor) New Britain, Connecticut—New York, Chicago, London.

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- Herald, Bellingham, Wash.
- Herald Post, Louisville, Ky.
- Huntsville Times, Huntsville, Ala.
- Miami Daily News, Miami, Fla.
- New York Times, New York, N. Y.
- Niagara Falls Gazette, Niagara Falls, N. Y.
- Press-Herald, Portland, Me.
- Scranton Times, Scranton, Pa.
- Star-Gazette, Elmira, N. Y.
- Star News, Los Angeles, Calif.
- The News, New York, N. Y.
- Times, Pawtucket, R. I.
- Times, Tampa, Fla.
- Toledo Blade, Toledo, Ohio
- Tribune, Oakland, Calif.
- Tribune Tower, Chicago, Ill.

THE NEWS BUILDING, New York

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General Contractors: Hegeman-Harris Co., Inc.
Engineers for Plant Section: Lockwood-Greene, Inc.

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Hardware that lasts – Base Metals of Bronze or Brass

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A TRUMBULL INSTALLATION

This new Montgomery Ward & Co. Building is a 100% Trumbull job

IN the new Montgomery Ward Building at Albany, N. Y. all of the lighting panelboards and power distribution panelboards were of "Circle T" manufacture, as was also the safety type main switchboard illustrated above. Incidentally, all the safety switches used throughout this very modern and interesting building were of "Circle T" construction, making the whole a 100% Trumbull job.

See the Trumbull "Circle T" catalogue in the new 4-volume Sweet's Vol. D, pages 5164-5165.

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BRIXMENT mortar is used regularly for mid-winter masonry even in the severest northern climates.

In fact, during the winter months more Brixment is sold in proportion to the volume of building construction *than at any other time.* Louisville Cement Company, Incorporated, Louisville, Kentucky.

CEMENT MANUFACTURERS SINCE 1830

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for MASONRY **and STUCCO**

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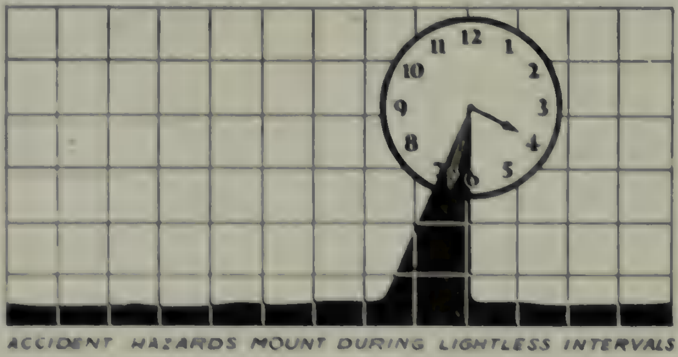
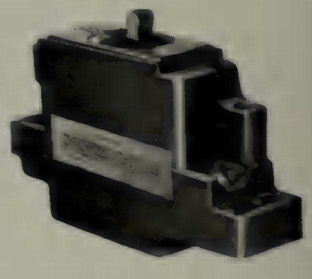
PROVISION for reducing lightless intervals is as much a part of good lighting as adequate illumination and well-planned lighting circuits. During these lightless intervals workers stand idle . . . busy machines are stopped . . . spoilage increases . . . and accident hazards mount.

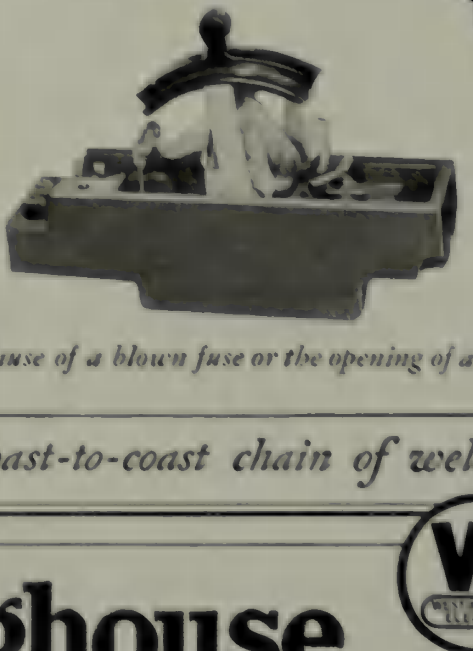
Westinghouse Nofuz panelboards decrease lightless intervals to the minimum. Momentary overloads do not open the circuit—but the wiring is protected at all times. When, on abnormal overloads the breaker opens the circuit, service can be restored by anyone by a flip of the handle—provided the overload is cleared. However, the breaker cannot be held closed against an abnormal overload—the mechanism trips free from the handle.



ACCIDENT HAZARDS MOUNT DURING LIGHTLESS INTERVALS

The non-welding contacts on Nofuz panelboard breakers have withstood repeated openings of a 5000-ampere short circuit. Also, breakers have been operated more than 67,000 times at full load without damage.





Above—*Nofuz breaker enclosed in a fire and moisture-proof asbestos composition housing.*

Left—*Nofuz breaker with cover removed.*

★ Lightless Intervals are periods when lights are out because of a blown fuse or the opening of a circuit protecting device.

Service, prompt and efficient, by a coast-to-coast chain of well-equipped shops

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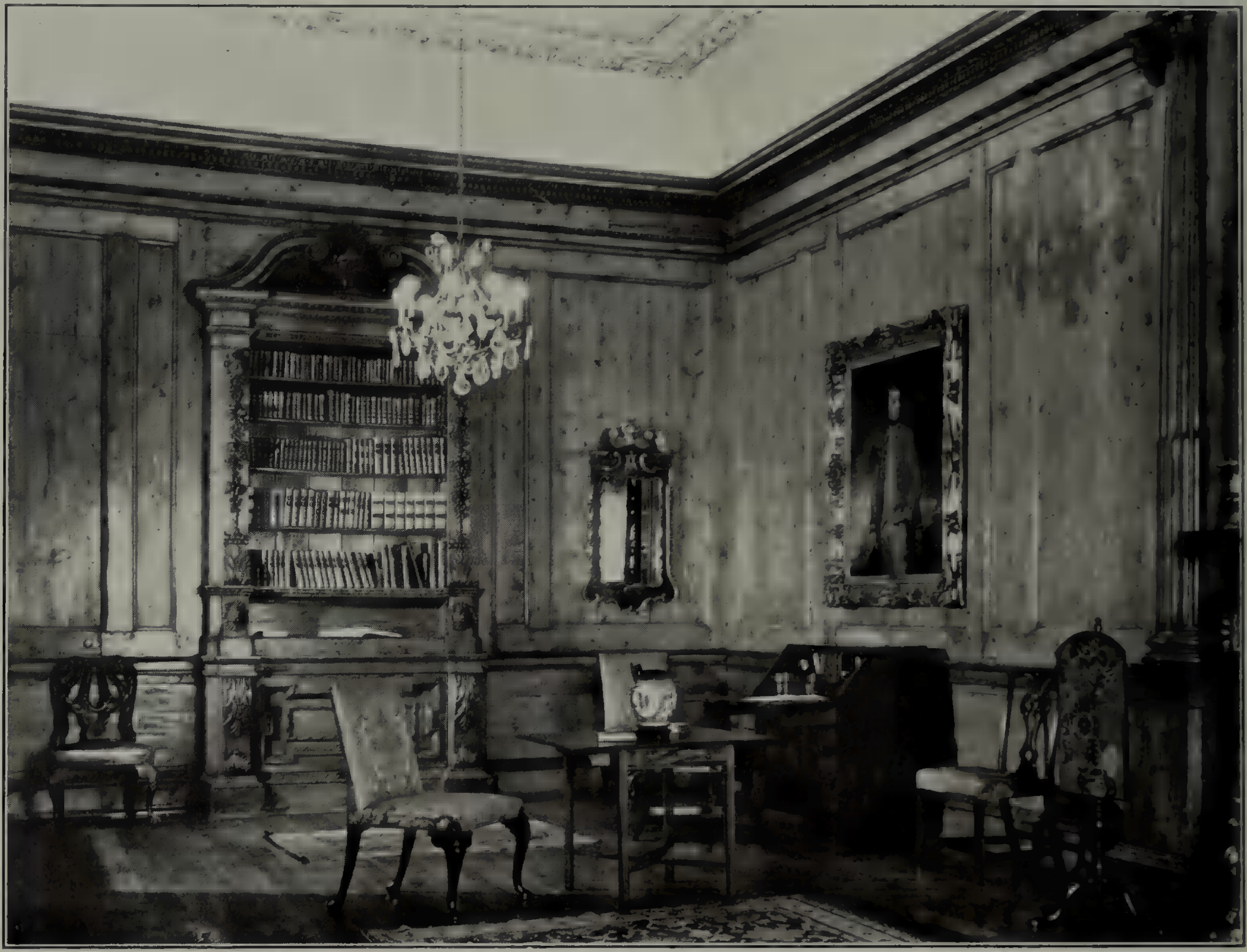
The BEAUTY *of* XVIIIth CENTURY PINE



The Pine Drawing Room from Charlton House, Greenwich, Kent.

THE SPLENDID ROOM, a corner of which you see above, is one of four panelled rooms of exceptional interest Charles Roberson of London installed in the City Art Museum of Saint Louis under the direction of Mr. Louis A. La Beaume, Architect and Museum Director. This room, reminiscent of James Gibbs in its classic proportions and extraordinarily interesting detail, has been cleaned of coat after coat of paint and now presents the beautiful honey-toned texture of that most decorative wood, knotty English Pine.

Mr. Roberson not only has some six antique pine panelled rooms on exhibition in New York City, but has perfected a method of treating well seasoned English pine—which he selects and imports himself—that gives to this wood the colour and texture otherwise unobtainable save by age. His studios at East 67th Street and factory in Long Island City are specially equipped to create and manufacture fine interiors.

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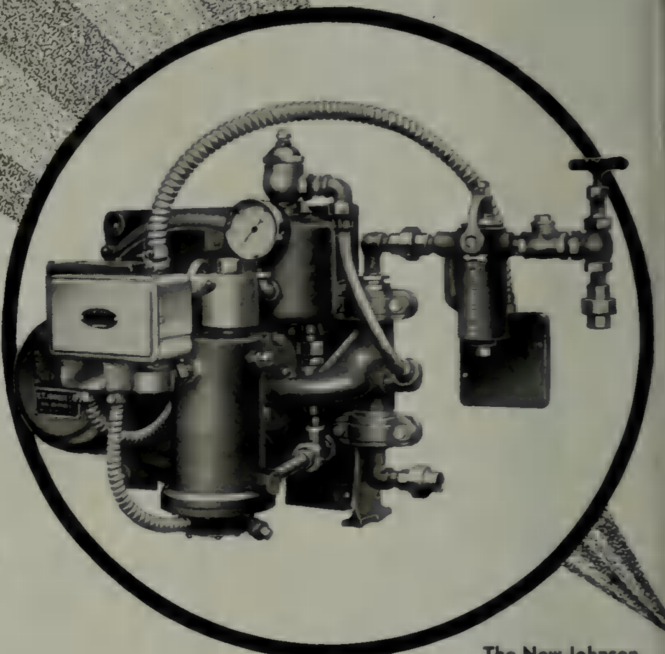

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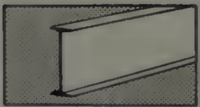
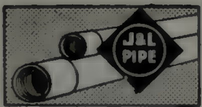

J&L JUNIOR BEAMS



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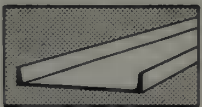
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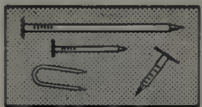
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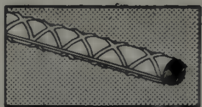
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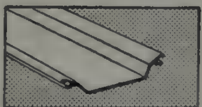
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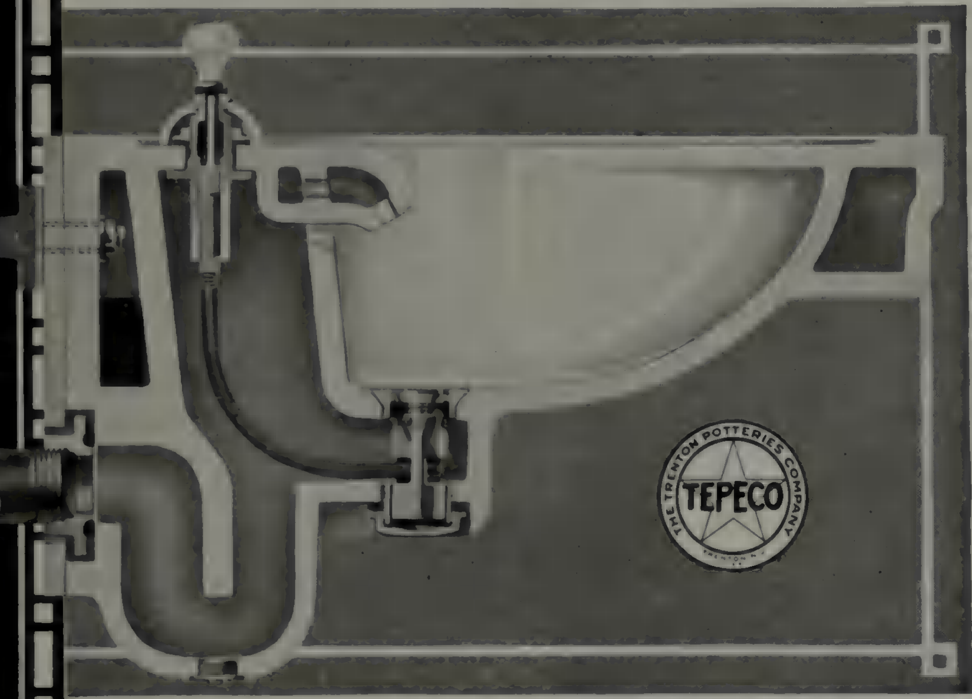
Plate 2081-T
Te-pe-co "Gothian" Lavatory with combination Supply Fittings on Slab.

Plate 2085-T
Te-pe-co "Gothian" Lavatory with Combination Supply Fittings through wall.

Plate 2083-T
Te-pe-co "Gothian" Lavatory with All-China Combination Supply Fittings on Slab.



We have named this new Lavatory the "Gothian". It is exclusively a Te-pe-co Product, covered by patents granted and pending. Unquestionably it is the most beautiful and sanitary lavatory of all time. Aside from these points, its complete elimination of exposed brass and its ease of installation make it a wonderful advance in the field of sanitary plumbing.

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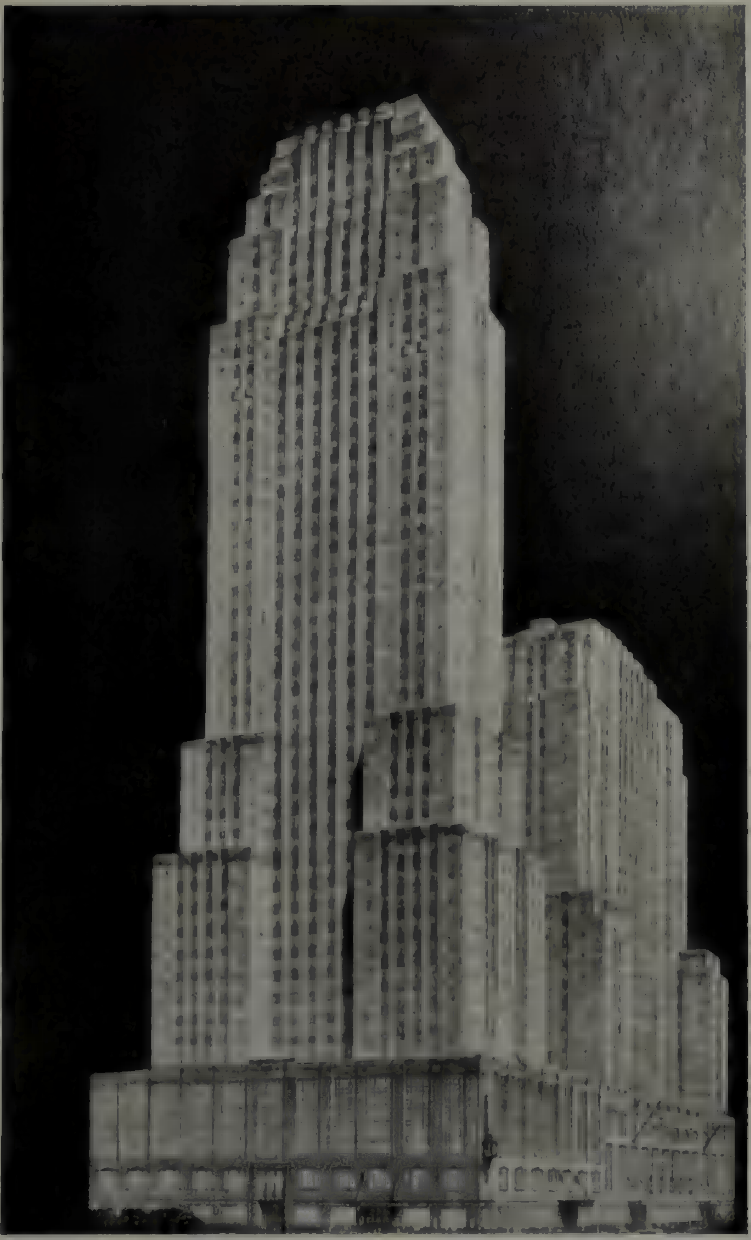

And again CARNEGIE BEAMS are selected for important Cincinnati project

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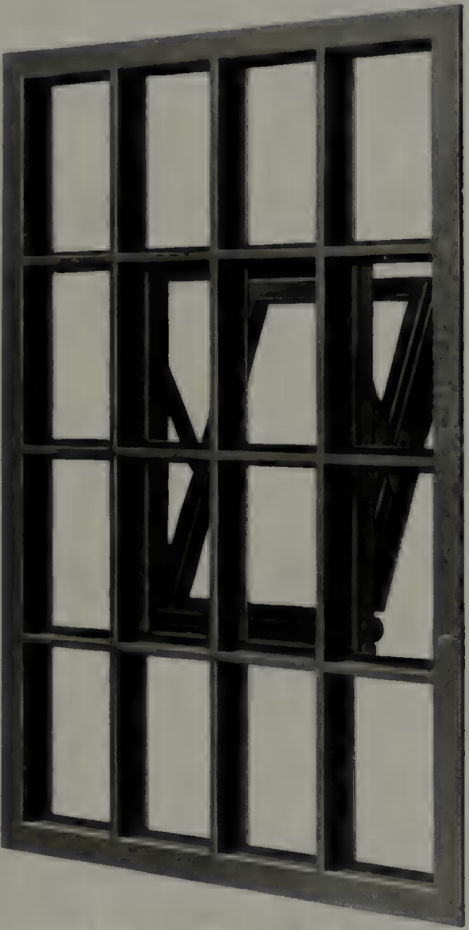

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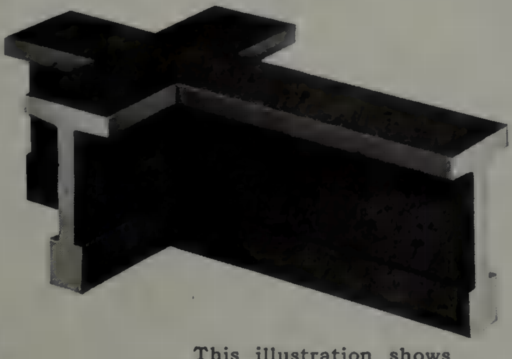
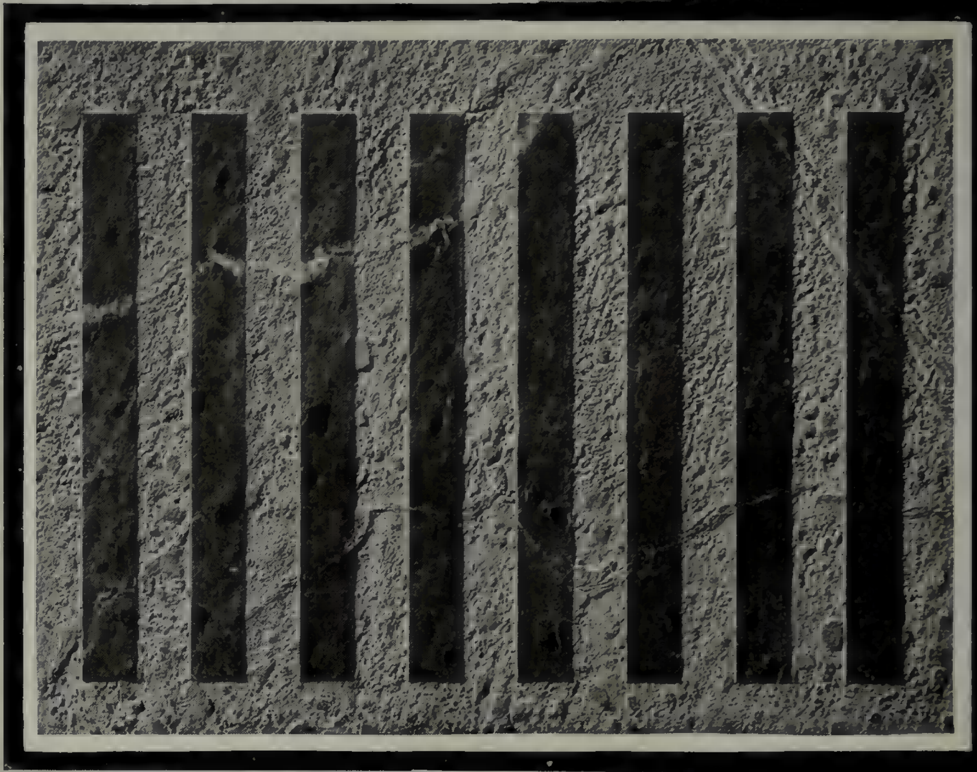


This illustration shows Bayley Super Bar intersection, one half actual size.



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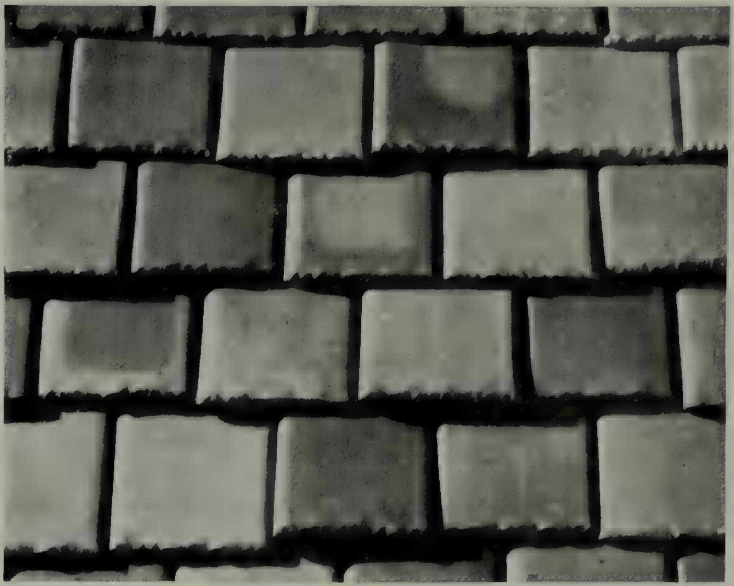
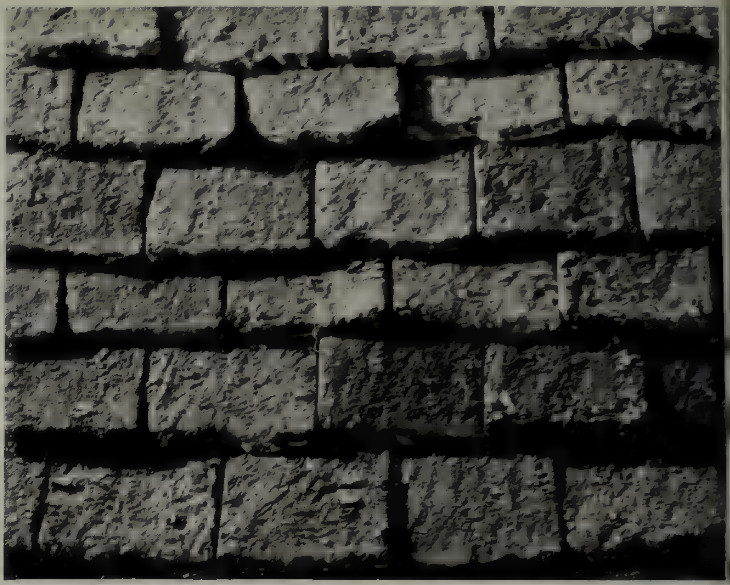


IMPERIAL Provincial Shingle Tiles



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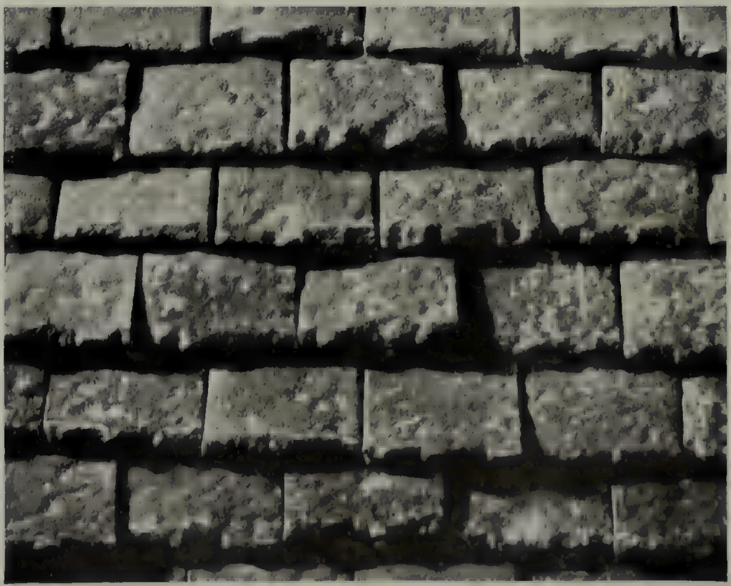
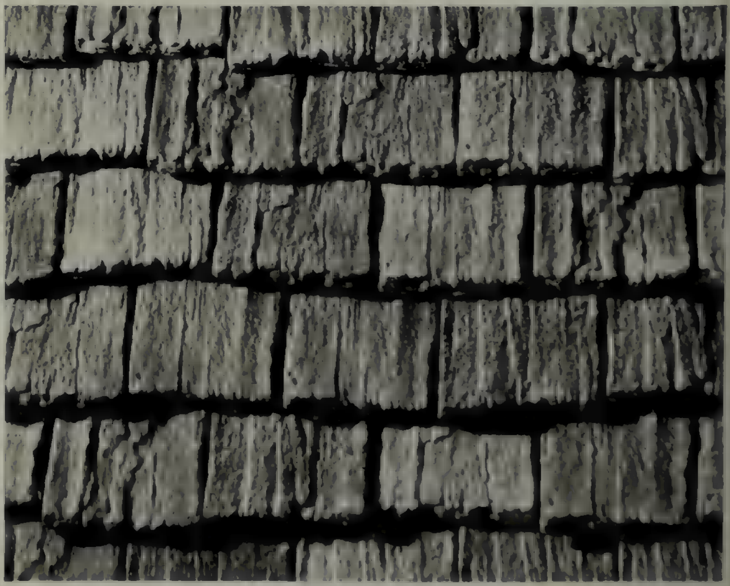


IMPERIAL Brittany Shingle Tiles



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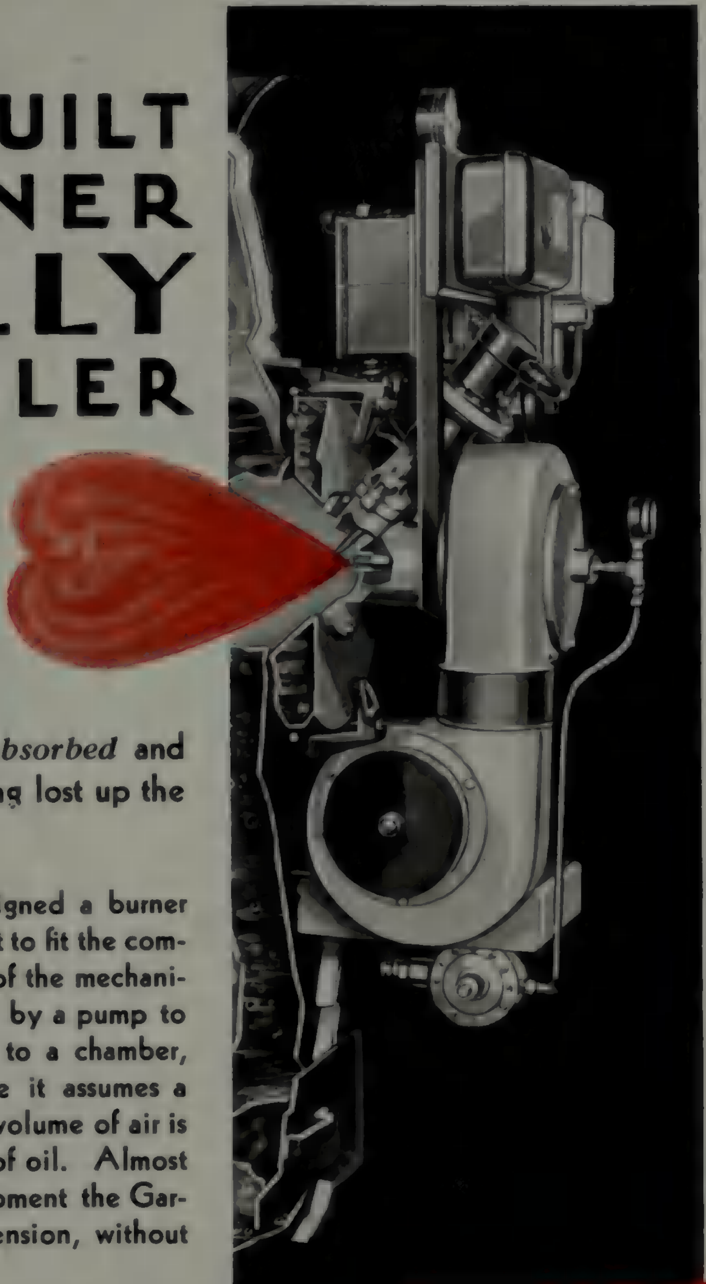
THEY BUILT A BURNER SPECIALLY FOR THE BOILER



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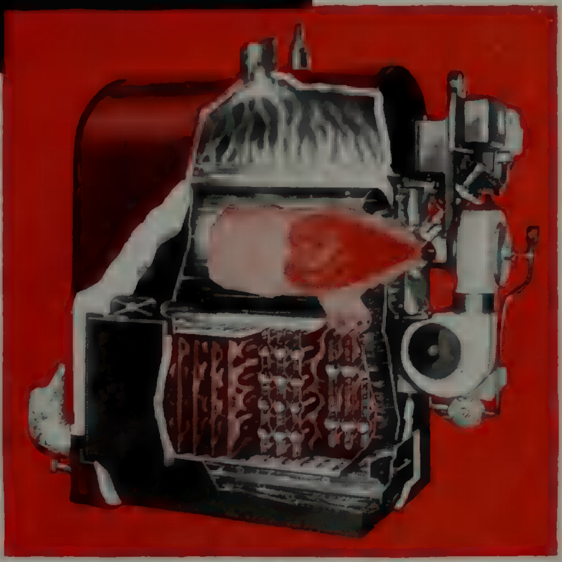

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Some of the Architects

Bernard H. Prack	Pittsburgh
The Ballinger Company	New York and Philadelphia
R. W. Foote	New Haven, Conn.
Samuel M. Green Co.	Springfield, Mass.
George F. Hardy	New York, N. Y.
Melvin L. King	Syracuse, N. Y.
Warren B. Lewis	Providence, R. I.
C. Howard Lloyd	Harrisburgh, Pa.
Lockwood Greene Engineers, Inc.,	Boston and New York
McKenzie, Voorhees & Gmelin	New York, N. Y.
Monks & Johnson	Boston, Mass.
F. A. Norcross	Boston, Mass.
Albert Kahn	Detroit, Mich.
Henry L. & W. T. Spann	Buffalo, N. Y.
Starrett & Van Vleck	New York, N. Y.
Heacock & Hokanson	Philadelphia, Pa.
Hutchins & French	Boston, Mass.
Horace Trumbauer	Philadelphia, Pa.
Day & Zimmerman	Philadelphia, Pa.
J. Foster Warner	Rochester, N. Y.

Some of the Buildings

Western Electric
United States Government
American Cyanamid
Bethlehem Steel
Pennsylvania R. R.
Baltimore & Ohio R. R.
American Radiator
General Electric
St. Regis Paper Co.
Youngstown Sheet & Tube
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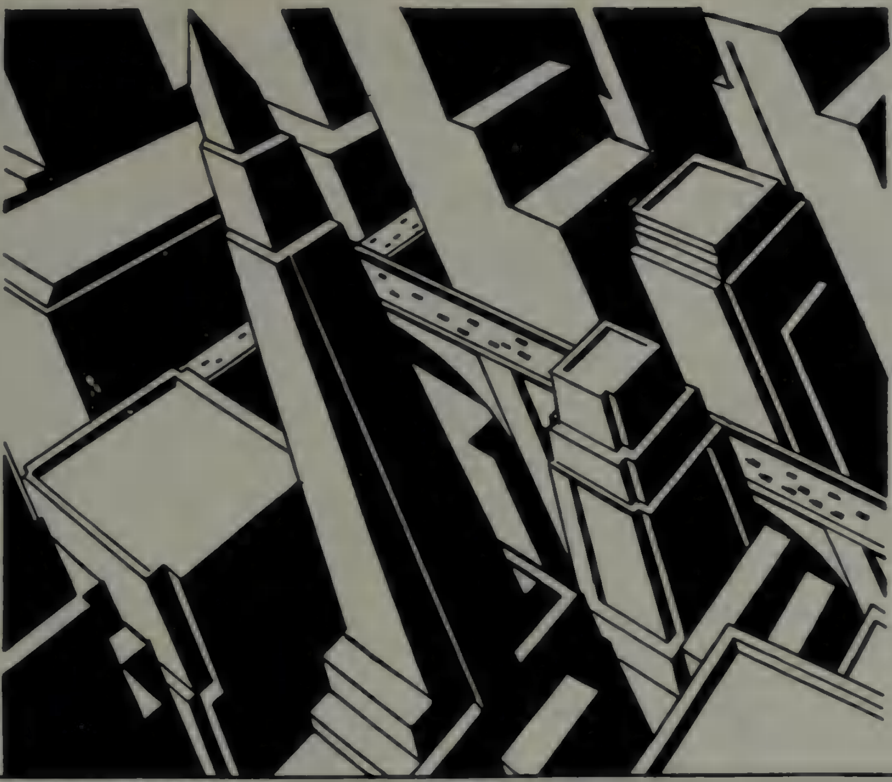

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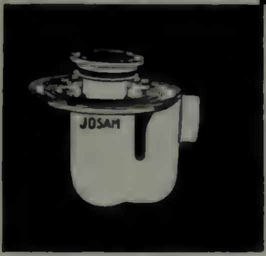

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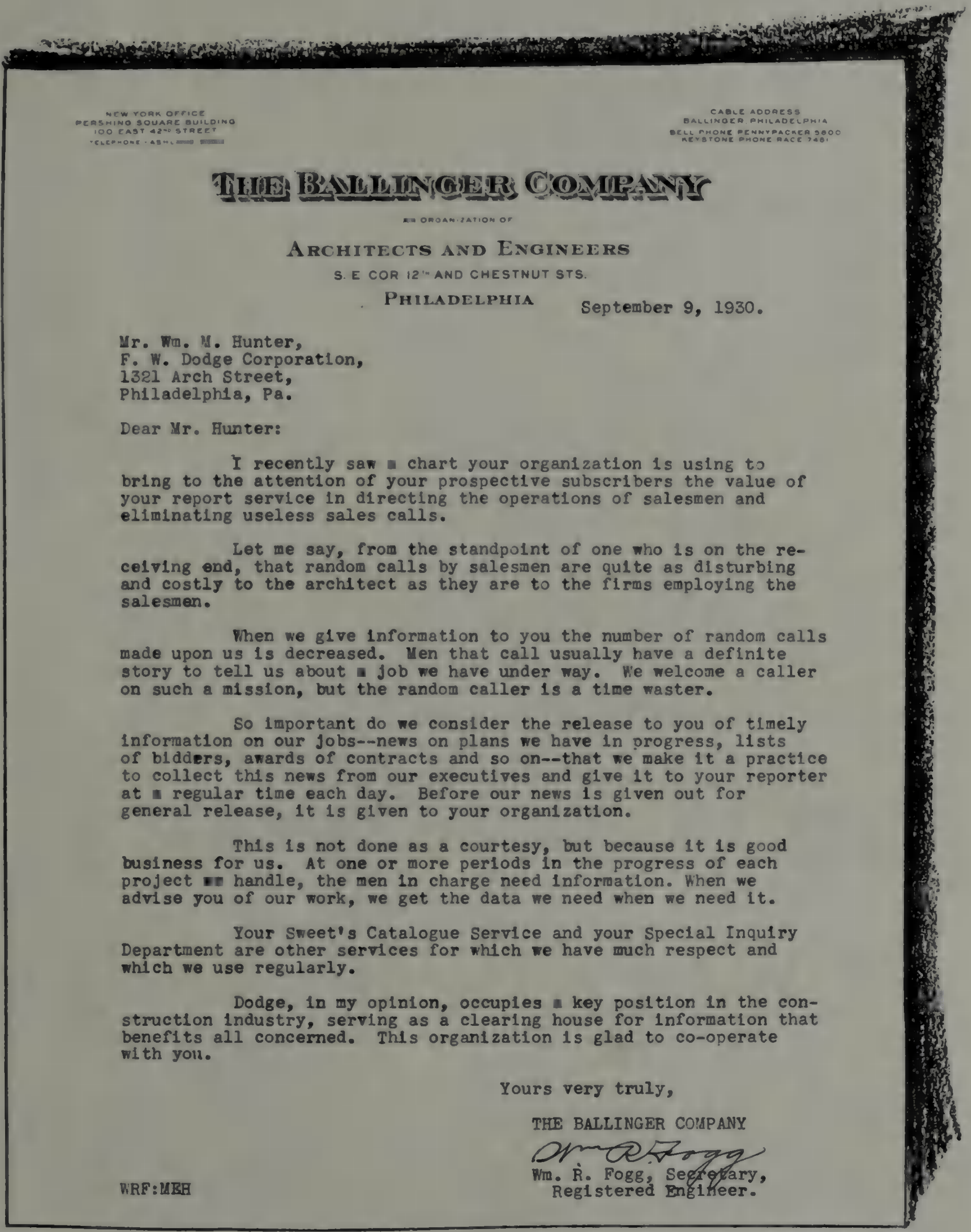
This distinguished firm was organized in 187 by Walter H. Geissinger, who took into partnership Edward M. Hales. In 1894, after the retirement of the founder, Mr. Hales associated wit Walter F. Ballinger. Mr. Hales retired in 190 and the firm became Ballinger & Perrot. Te years ago Mr. Ballinger purchased the entir interest and the present name was adopted. I 1925, upon the death of Walter F. Ballinger the business was continued by a partnershi including:

	Years o Service
Robert I. Ballinger, R.A.	14
William R. Fogg, R.E.	26
Clifford H. Shivers, R.A., R.E.	25
Carl de Moll, R.A., R.E.	21
Jean Paul Richter, R.A.	28
Josiah H. Smith, R.E.	16
George W. Stinson, R.A.	22

Below, Watson Stabilator Company building, a recent commission executed by The Ballinger Company. Below, left, reception room in the Philadelphia offices of this firm. Below, right, nationally known clients that have given two or more commissions to The Ballinger Company

RCA-Victor Company	41 orders	Camden, N. J.
Atwater Kent Mfg. Co.	5 "	Philadelphia, Pa.
E. G. Budd Mfg. Co.	6 "	Philadelphia, Pa.
The Viscose Company	26 "	Marcus Hook, Pa.
The Viscose Company	9 "	Lewiston, Pa.
The Viscose Company	9 "	Roanoke, Va.
The Viscose Company	4 "	Nitro, W. Va.
The Viscose Company	new plant	Parkersburg, W. Va.
Salt's Textile Mfg. Co.	2 orders	Bridgeport, Conn.
Duplan Silk Corporation	6 "	Hazelton, Pa.
James Lees & Sons Co.	4 "	Bridgeport, Pa.
Hardwick & Magee	16 "	Philadelphia, Pa.
Esterbrook Steel Pen Co.	6 "	Camden, N. J.
Otis Elevator Company	3 "	Philadelphia, Pa.
Fels & Company	6 "	Philadelphia, Pa.
Federal Paper Board Co.	5 "	Bogota, N. J.
John Lucas Company	6 "	Philadelphia, Pa.
Harrison Brothers Co.	3 "	Philadelphia, Pa.
Patterson-Sargent Co.	3 "	New York City
F. W. Tunnell & Co.	6 "	Philadelphia, Pa.
Hugo Bilgram	2 "	Philadelphia, Pa.
Barrett Mfg. Company	3 "	Philadelphia, Pa.
A. Schoenhut Company	3 "	Philadelphia, Pa.
J. D. Johnson Company	2 "	Philadelphia, Pa.
American Ice Company	3 "	Philadelphia, Pa.
Lester Piano Company	9 "	Lester and Philadelphia, Pa.

Gives News to DODGE



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September 9, 1930.

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F. W. Dodge Corporation,
1321 Arch Street,
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Dear Mr. Hunter:

I recently saw a chart your organization is using to bring to the attention of your prospective subscribers the value of your report service in directing the operations of salesmen and eliminating useless sales calls.

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So important do we consider the release to you of timely information on our jobs--news on plans we have in progress, lists of bidders, awards of contracts and so on--that we make it a practice to collect this news from our executives and give it to your reporter at a regular time each day. Before our news is given out for general release, it is given to your organization.

This is not done as a courtesy, but because it is good business for us. At one or more periods in the progress of each project we handle, the men in charge need information. When we advise you of our work, we get the data we need when we need it.

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Yours very truly,

THE BALLINGER COMPANY

Wm. R. Fogg
Wm. R. Fogg, Secretary,
Registered Engineer.

WRF:MEH

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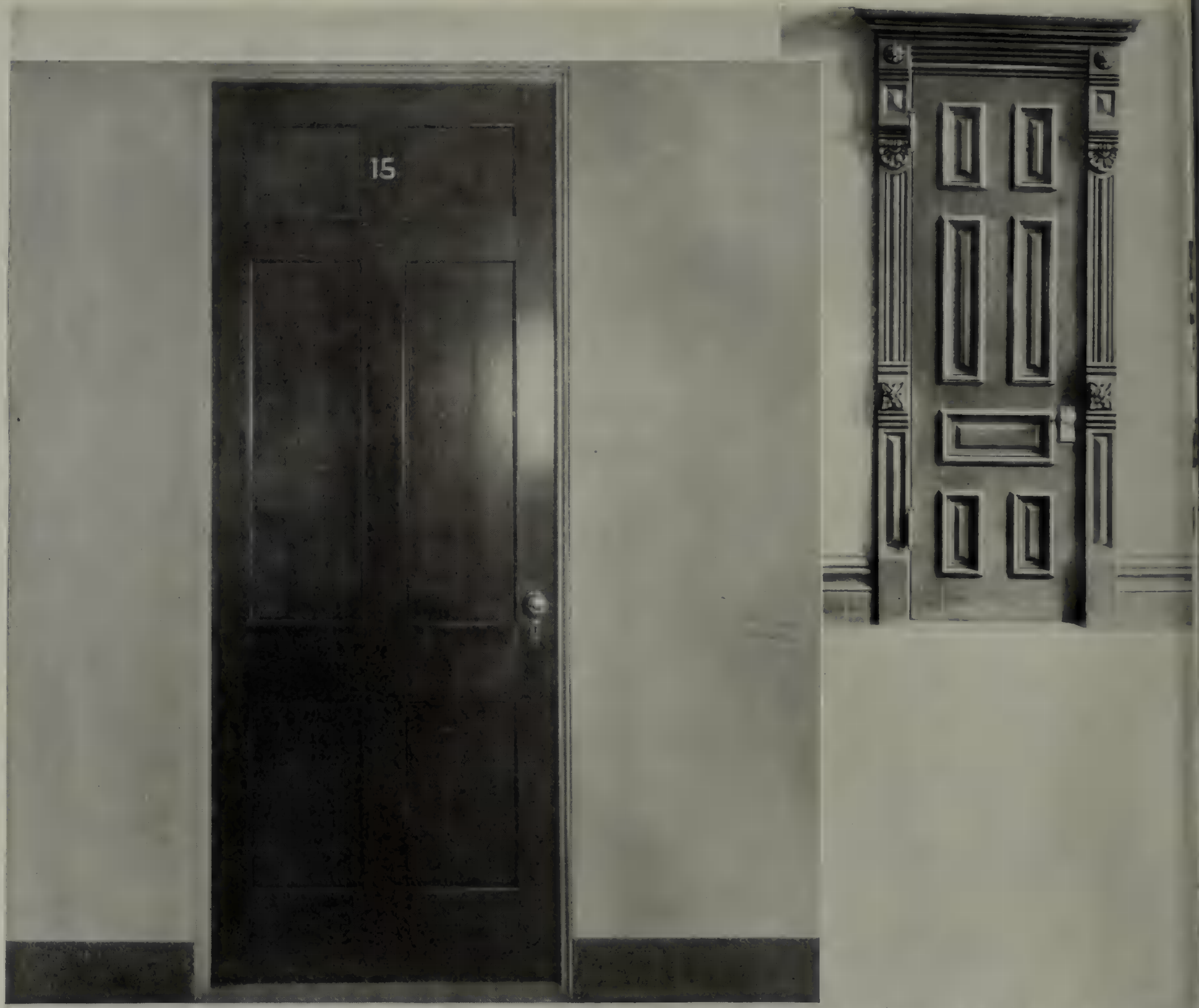

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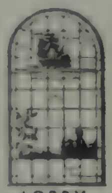
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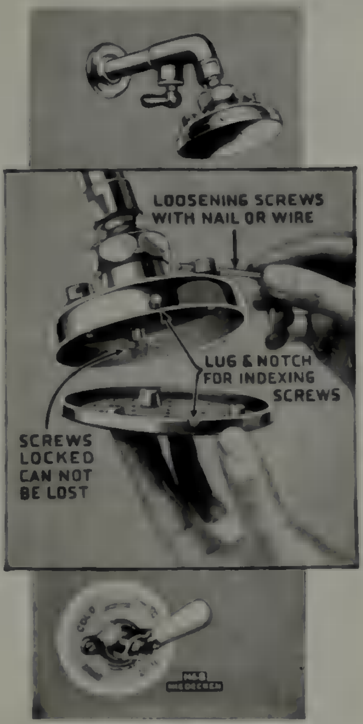
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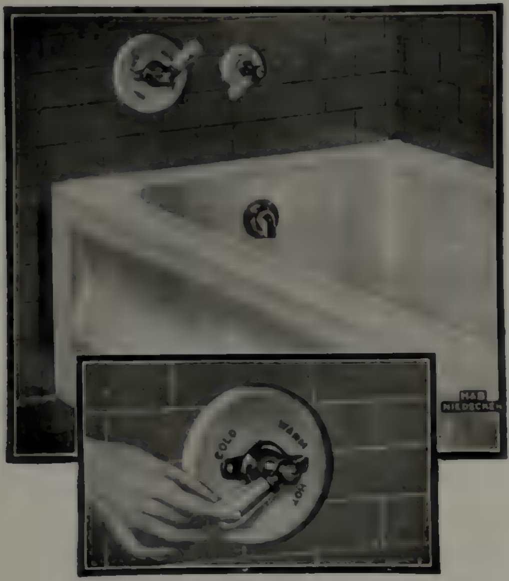

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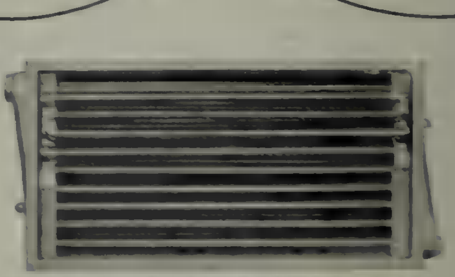

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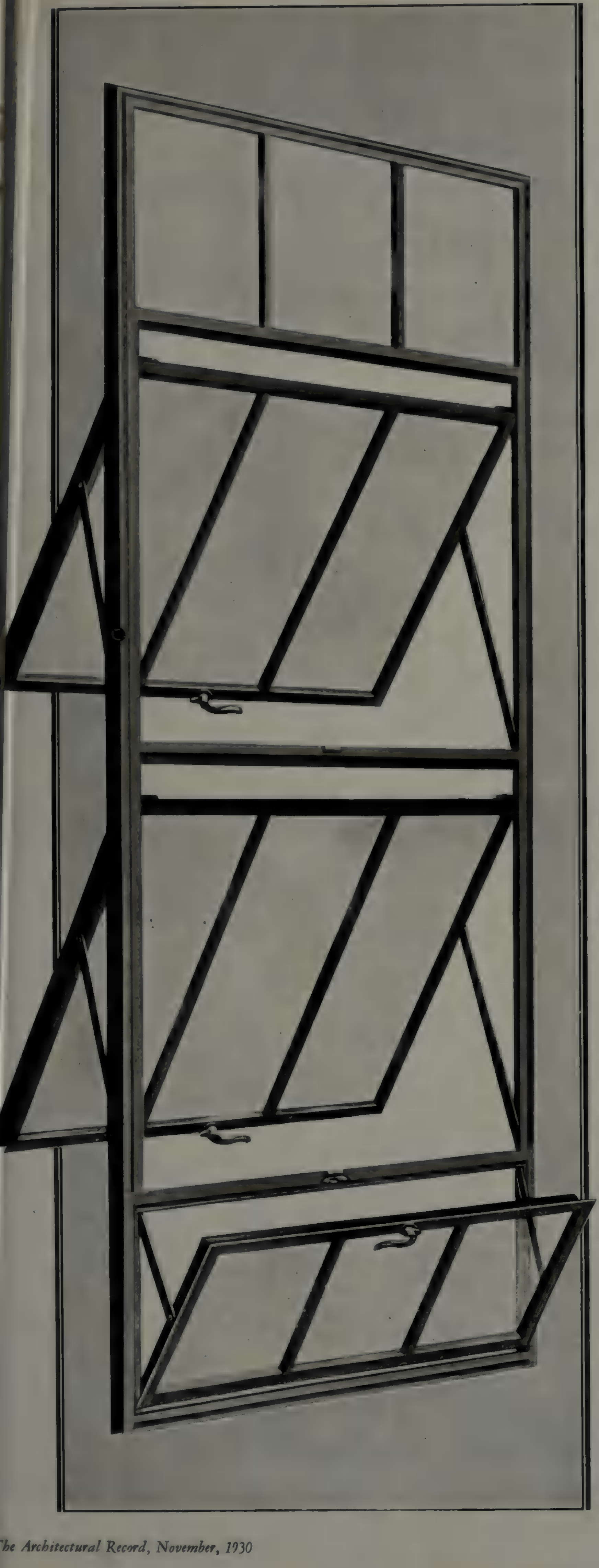

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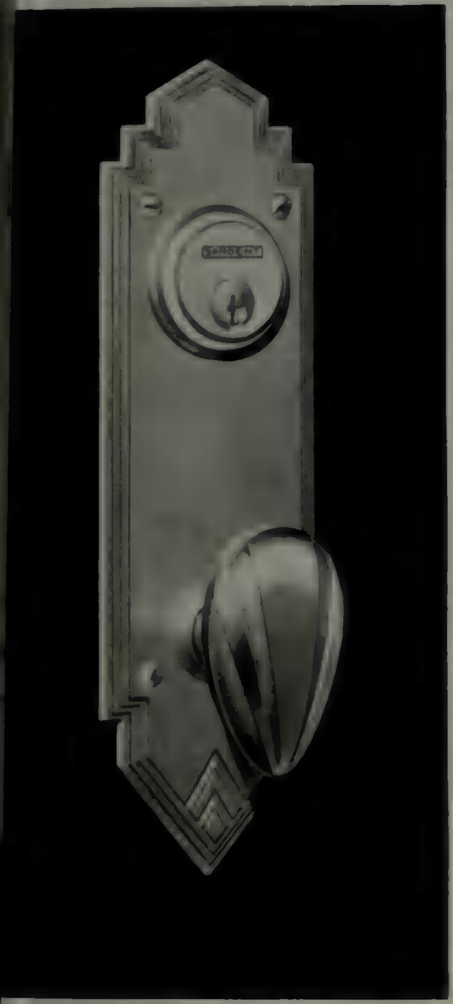

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Rubush and
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Architects.

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Indianapolis — Equipped with

"PANELOUVRE"

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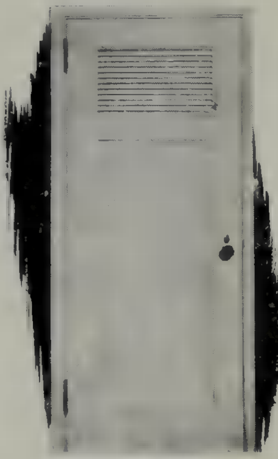

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**For Specifications and Details See
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You will marvel at its simple, sturdy construction. It is made completely from the finest brass, and has only two moving parts. The bubblerhead is instantly accessible for adjusting and cleaning if ever necessary. An integral guard makes it impossible for any waste from the drinker's mouth to fall back on the source of the water. A novel device makes these bubblerheads absolutely unsquirtable. A necessary requisite in schools and public institutions.

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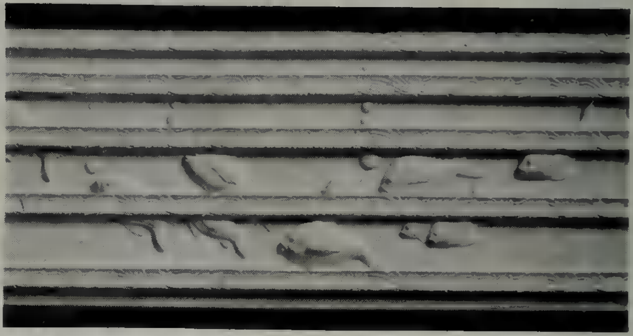

MODERN DESIGN

For the last twelve months the designers and modelers of Jacobson & Company have been at work compiling the material for this new Catalogue. The new models pictured are the creation of our own designing staff, and have been selected for publication as being eminently usable in various types of buildings.

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NOTE: Models listed in former catalogues are always available.

Pendant luminaires proved attractive illumination for the banking room.

* * *

The exterior of the building is floodlighted by five lantern standard units.

BANK LIGHTING

that suggests security and dignity

by WILLIAM NEUMANN, A. I. A.
of William Neumann & Sons, Architects
Jersey City, N. J.

IN the Boulevard Branch of the Hudson City Savings Bank at Jersey City, New Jersey, exterior floodlighting and modern interior lighting lend emphasis to the architectural design of the building and help to create an atmosphere that builds confidence in the bank's services.

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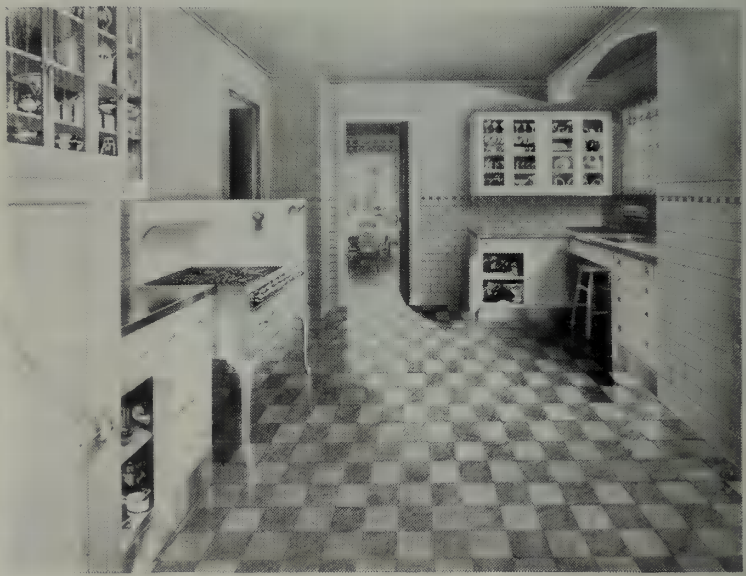

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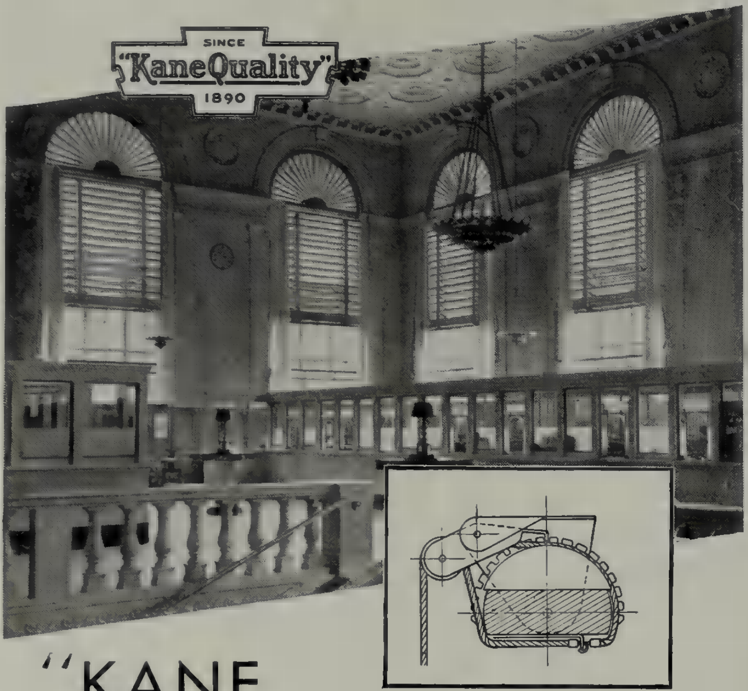

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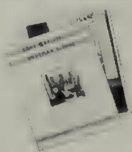

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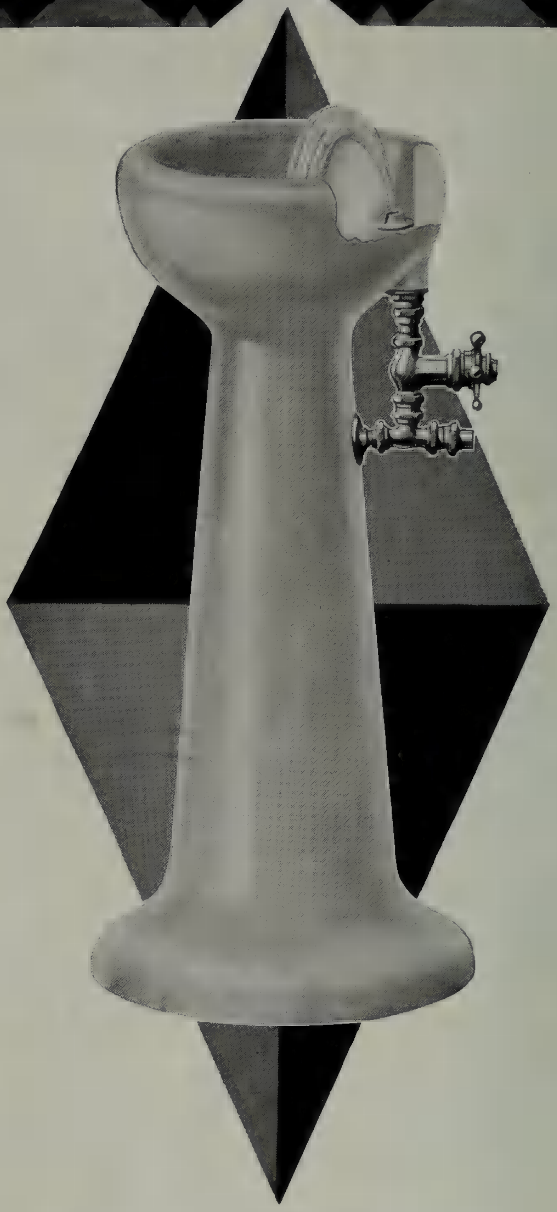

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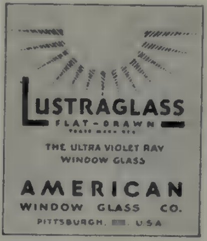

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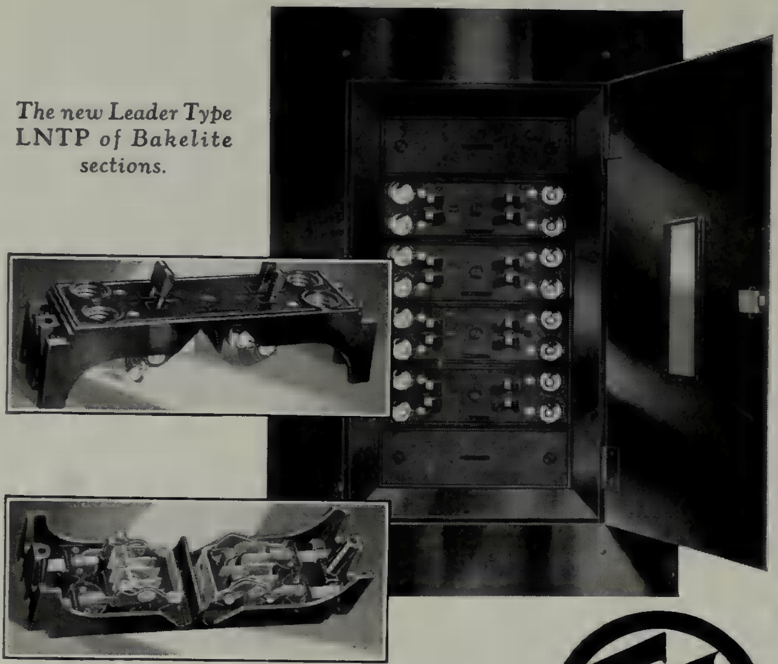

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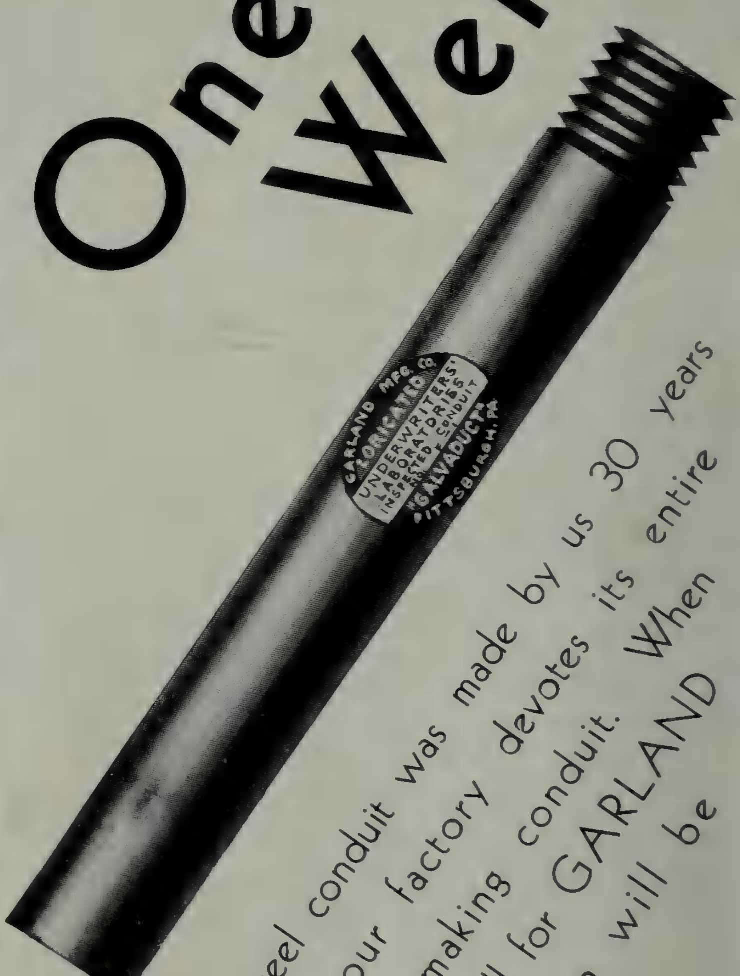

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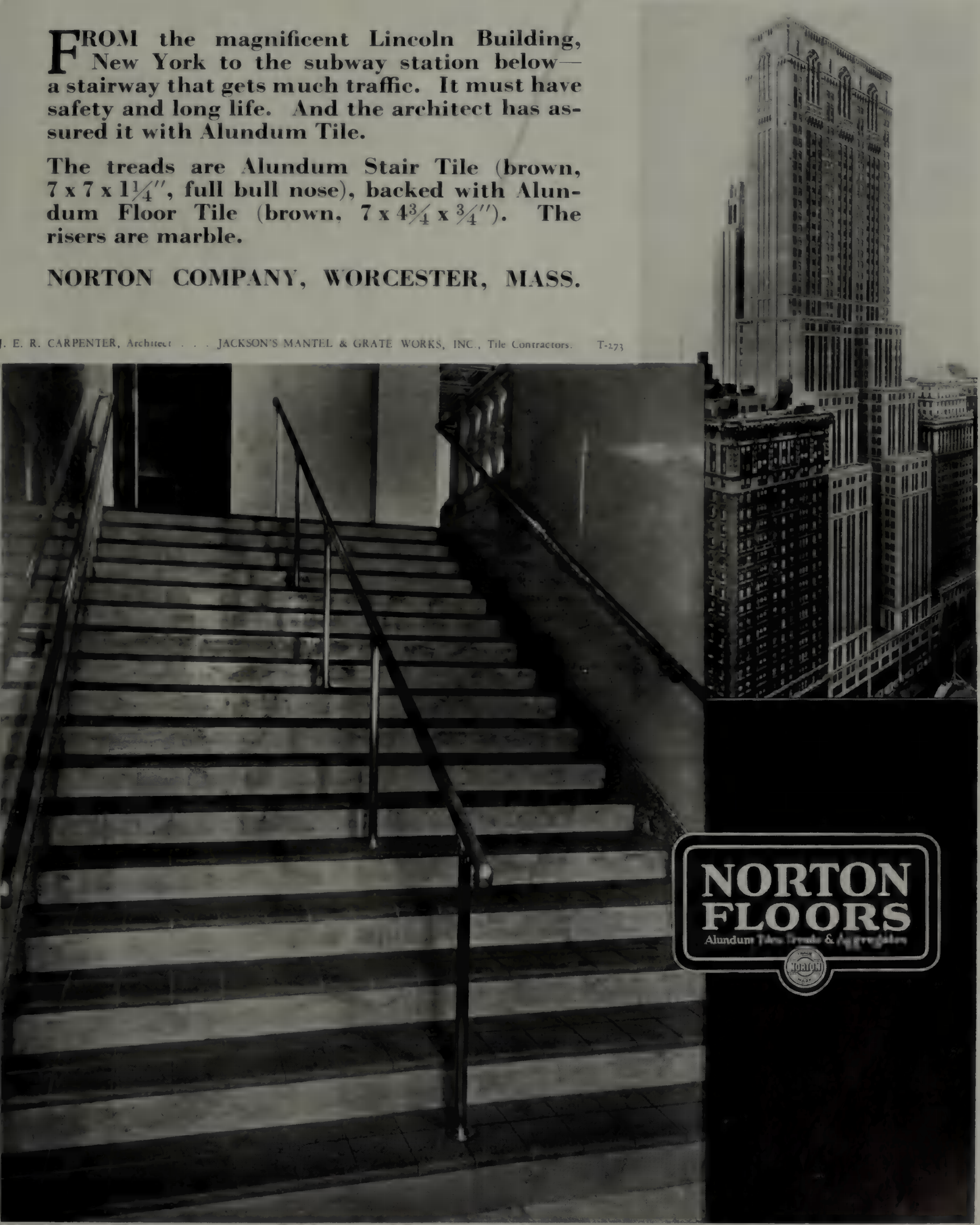

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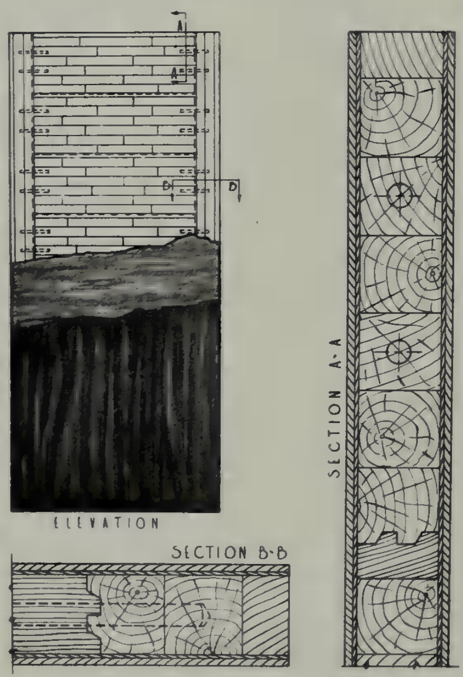

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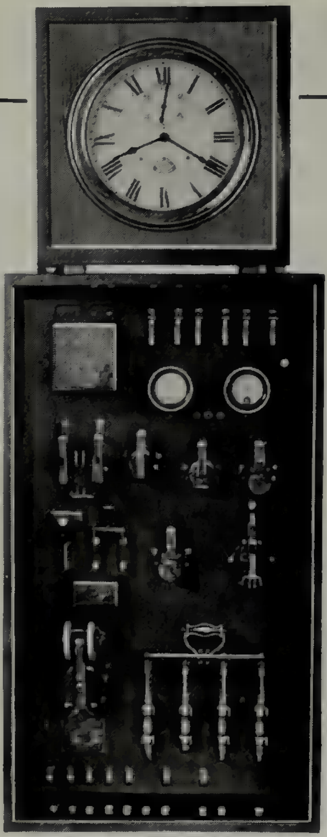

ILLUSTRATION shows Type AEG Emergency Lighting System Control Panel, mounted in steel cabinet with Electric Self Winding Clock for supervision and control of charge of storage battery, which is one of the many Landis features.

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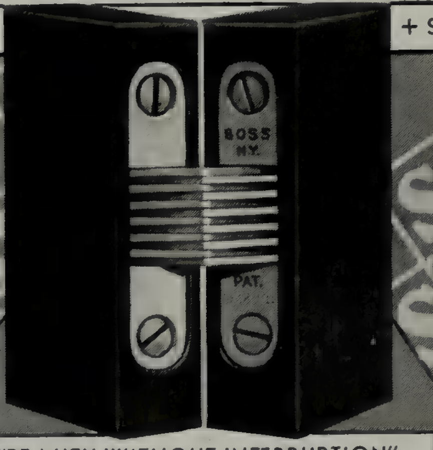

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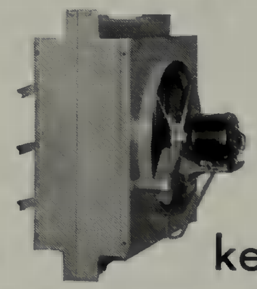

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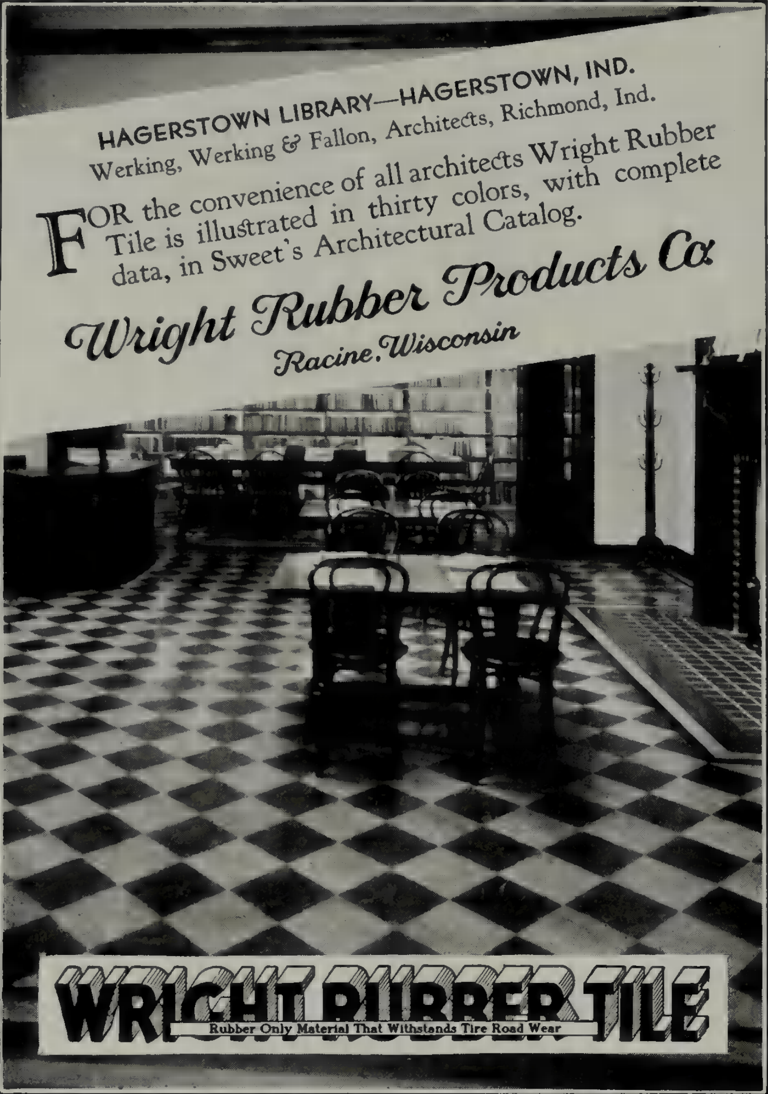

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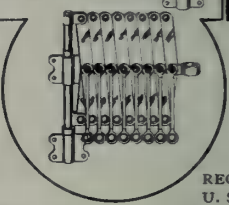

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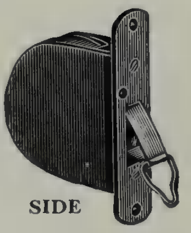

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Statement of the Ownership, Management, Circulation, etc., Required by the Act of Congress of August 24, 1912, of The Architectural Record published monthly at New York, N. Y., for October 1, 1930.

State of New York, County of New York, ss.: before me, a notary public in and for the State and county aforesaid, personally appeared J. A. Oakley, who, having been duly sworn according to law, deposes and says that he is the Business Manager of THE ARCHITECTURAL RECORD, published by F. W. Dodge Corporation, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, F. W. Dodge Corporation, 119 West 40th St., New York, N. Y.; Editor, Michael A. Mikkelsen, 119 West 40th St., New York, N. Y.; Managing Editor, A. Lawrence Kocher, 119 West 40th St., New York, N. Y.; Business Manager, J. A. Oakley, 119 West 40th St., New York, N. Y.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.) F. W. Dodge Corporation, 119 West 40th St., New York, N. Y., whose stockholders, owning 1% or more of the total amount of its stock, are: Florence Call Abbott, 15 Broad St., New York, N. Y.; Henry H. Abbott, 15 Broad St., New York, N. Y.; Dana T. Ackerly, 15 Broad St., New York, N. Y.; May Gibson Baker, c/o L. G. Collins, 285 Riverside Drive, New York, N. Y.; Jane Curtiss Breed, 850 Park Ave., New York, N. Y.; James McV. Breed, 15 Broad St., New York, N. Y.; William C. Breed, 15 Broad St., New York, N. Y.; Wesley D. Broadwell, 423 West 120th St., New York, N. Y.; Sumner Ford, 15 Broad St., New York, N. Y.; Michael A. Mikkelsen, 119 West 40th St., New York, N. Y.; Helen D. Morgan, 15 Broad St., New York, N. Y.; Laura O. Morgan, 1111 Park Ave., New York, N. Y.; Truman S. Morgan 1111 Park Ave., New York, N. Y.; John A. Oakley, 57 Union St., Montclair, N. J.; Minnie C. Ort, 189 Elm Ave., Teaneck, N. J.; George H. Partridge, Hotel Gramatan, Bronxville, N. Y.; Jane Abbott Pratt, c/o Henry H. Abbott, 15 Broad St., New York, N. Y.; William J. Quinn, 22 William St., New York, N. Y.; Sanford D. Stockton, Jr., 15 Broad St., New York, N. Y.; Marcus Wayne, 1681 Glenmont Rd., Cleveland Heights, Ohio; Charlotte D. Williams, Pointe Au Baril, Ontario, Canada.

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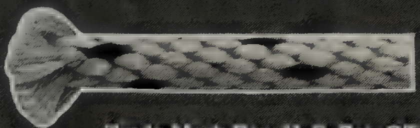

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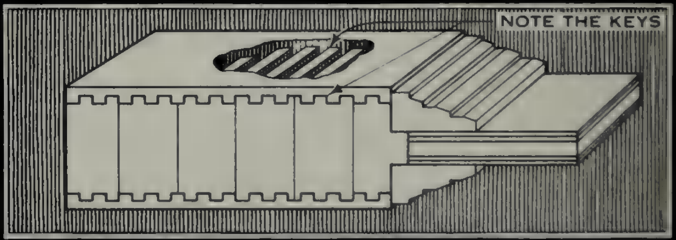

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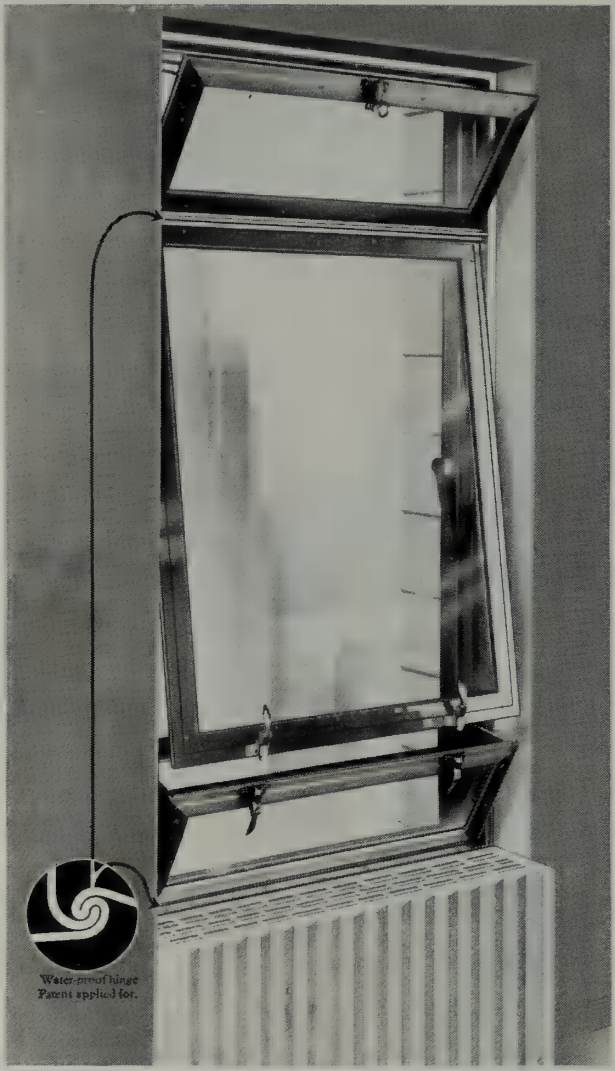

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Alphabetical Index to Advertisers, Page 178

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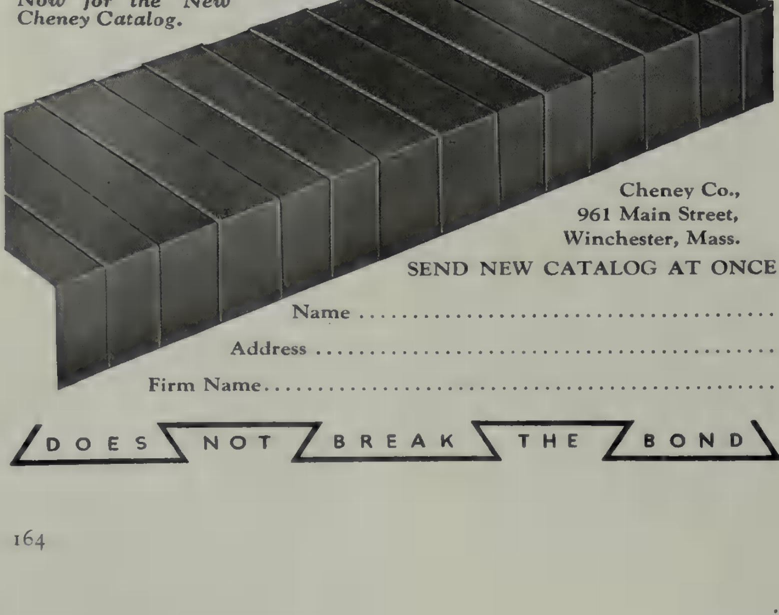

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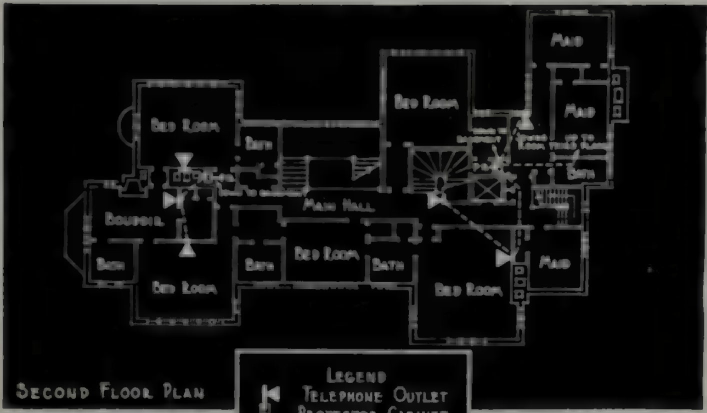

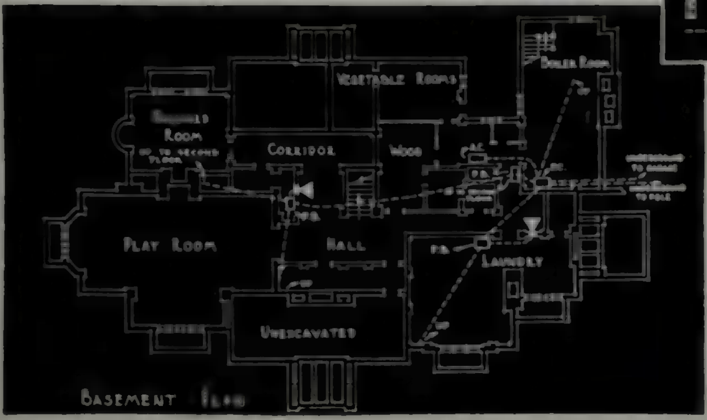

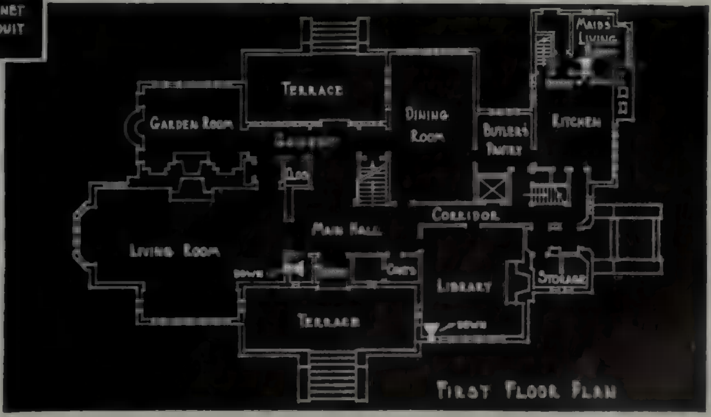

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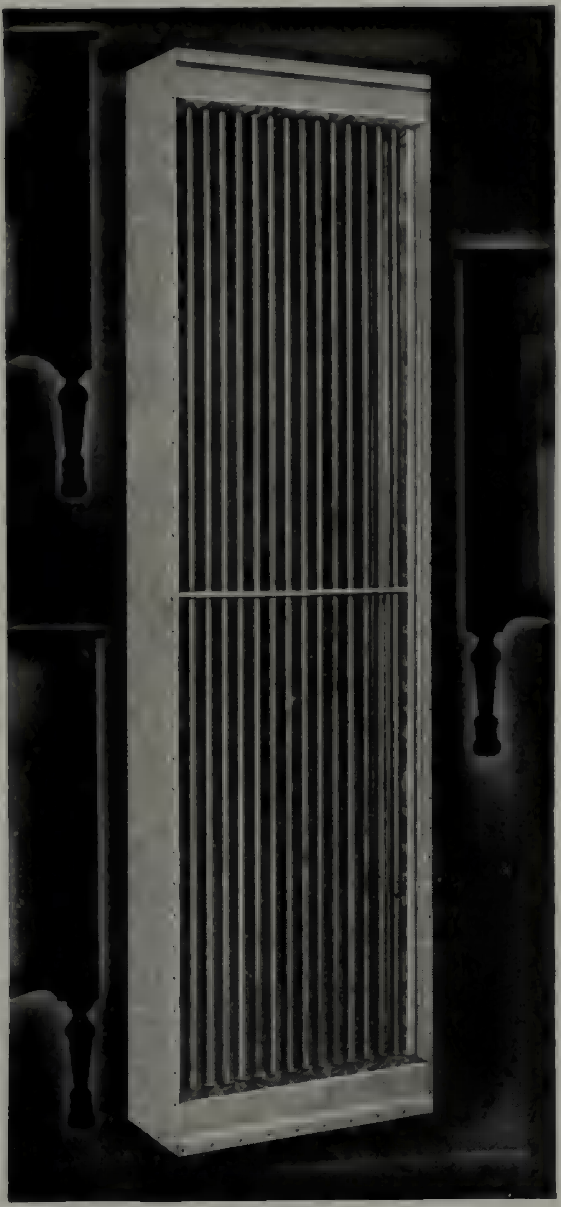

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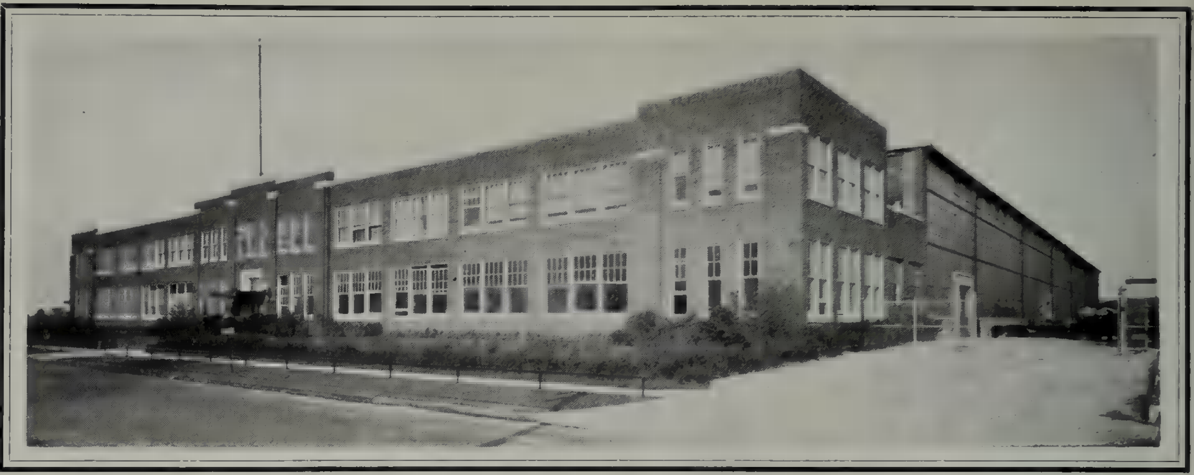

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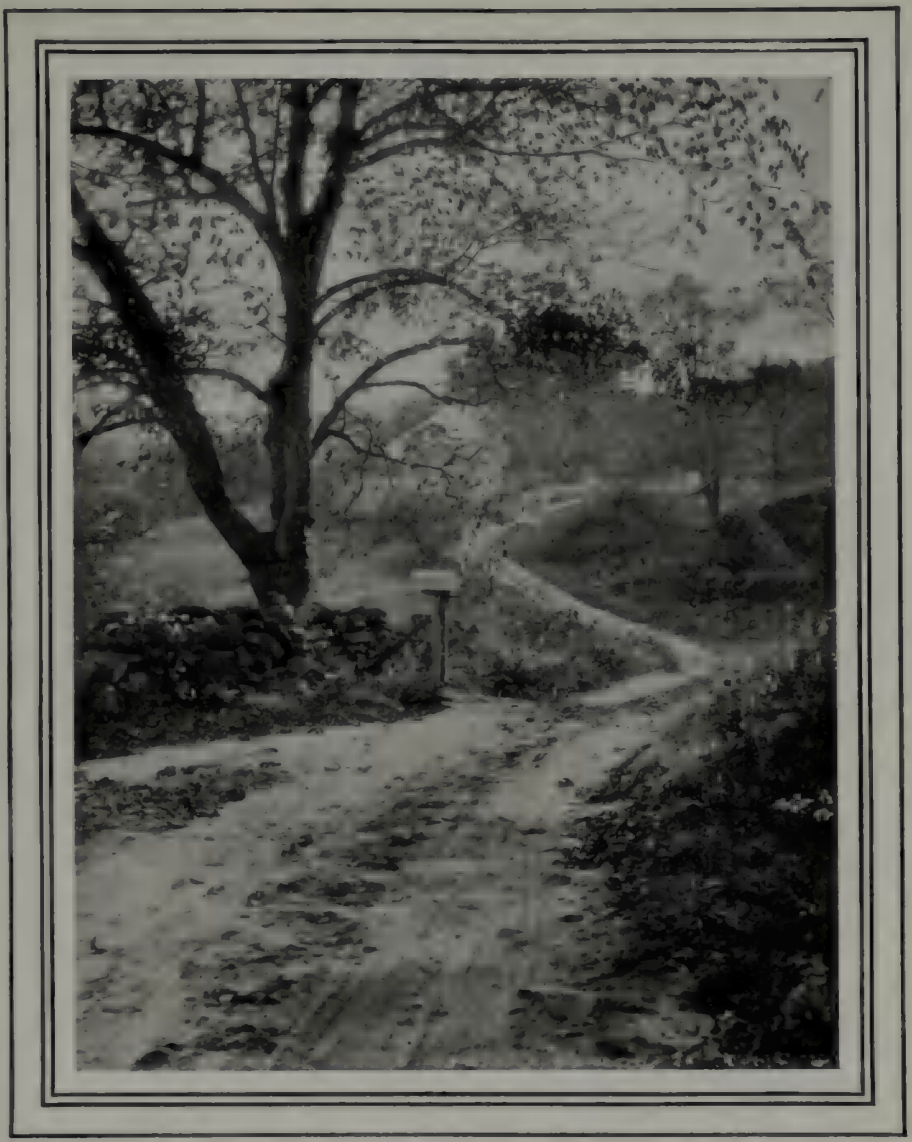

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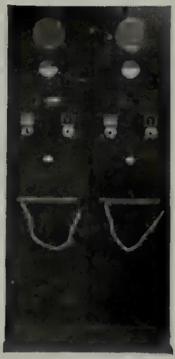

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An interesting corner of a breakfast room in one of the apartments

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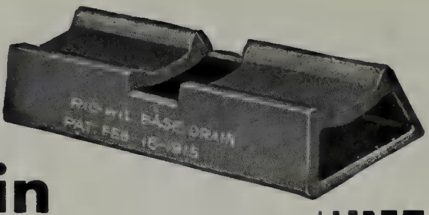

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Ric-wiL Vitrified Tile Base Drain, installed immediately under the Conduit, carries off outside moisture instantly, an arrangement virtually impossible with round drain. It also serves as a cradle for the Conduit, actually adding 40% to the ground load Conduit will carry, as tests have shown. In addition, it carries the entire weight of pipe supports and pipes and holds the pipes and Conduit in perfect alignment.

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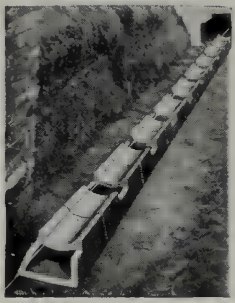
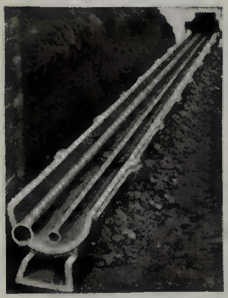


After trench is dug and graded, smooth bottom with sand, stake center line and set Base Drain in place.

In sandy soil Ric-wiL Filter Tape, placed over broken stone around Base Drain, absolutely prevents any possibility of Drain becoming clogged.

Bank with broken stone, wedge pipe support saddles between every sixth Base Drain, place bottom Conduit sections and wedge pipe supports on saddles.



Set balance of bottom Conduit sections, install and test pipes. Pack Dry-paC in bottom section, install top conduit section, fill space with Dry-paC, seal the Loc-liP Side Joint and job is done.

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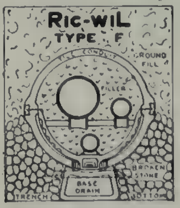

Cross section of Ric-wiL Type F Conduit with multiple pipe supports.

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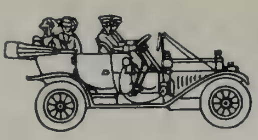

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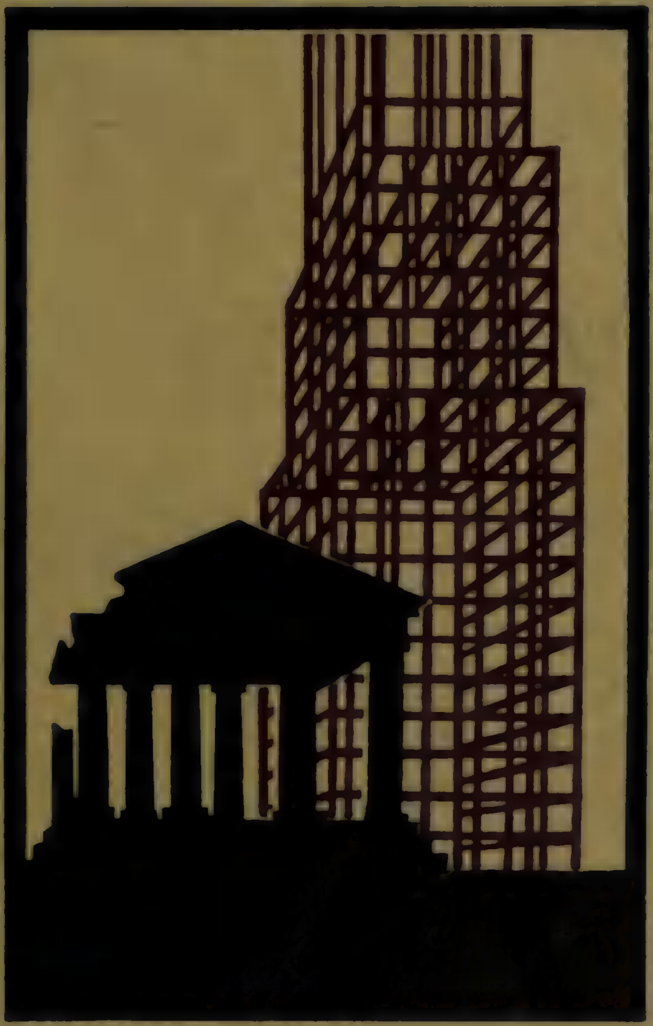

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Yearly Subscription: United States, Insular Possessions, Cuba, Canada, Central America, South America, and Spain, $5.00; Foreign, $6.50; Single Copy 75c.

F.W. DODGE CORPORATION

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Entered as second class matter May 22, 1902, at the Post Office at New York, N. Y., under the Act of March 3, 1879. Printed in U. S. A.

LEADING ARCHITECTS PREFER
TRUSCON PROTECTION

Harvard University School of Business Administration. McKim, Mead & White, Architects. Hegeman-Harris Company, Contractor. Over twelve tons of Truscon Waterproofing Paste used to waterproof the foundations.

THE close proximity of the Charles River rendered it imperative to employ the most effective waterproofing known for the foundations of the Harvard University School of Business Administration. As usual when fine buildings and difficult conditions demand certainty of waterproofing results, Truscon Waterproofing Paste Concentrated was the protective material selected. For nearly twenty years, leading architects have accorded Truscon Waterproofing an outstanding preference. Truscon's remarkable record of results provide an excellent reason why.

You can Dip this House in Water
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Write for Truscon Specification Book A for Waterproofings, Dampproofings and Oilproofings.

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Specify TRUSCON
Waterproofing Paste

Internal Revenue Building, Washington, D. C. Treasury Department, Architects. James A. Wetmore, Acting Supervising Architect. James Baird Company, Builders. Built largely of Variegated Indiana Limestone.

(Right) Architectural model of group of buildings included in Government's building program, which it is estimated will involve a hundred million dollars exclusive of land for sites, etc.

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Indiana Limestone Selected for First of New Government Buildings

THE first building in Washington's hundred million dollar construction program is constructed almost entirely of Indiana Limestone. This newest addition to the city's fine architecture emphasizes again the importance of materials in achieving the result you are after. It is proof anew that the fine-grained, light-colored stone from the hills of southern Indiana is considered by the architectural profession as suitable for the most noteworthy buildings of modern times.

Indiana Limestone is the logical answer to your demand for a material that is artistically and economically appropriate. By its natural beauty, ease of fabrication and accessibility to the markets of the country, it fills these requirements. Large scale production and modern fabricating methods make it moderate in cost. It is entirely practicable for the small building as well as for the larger project.

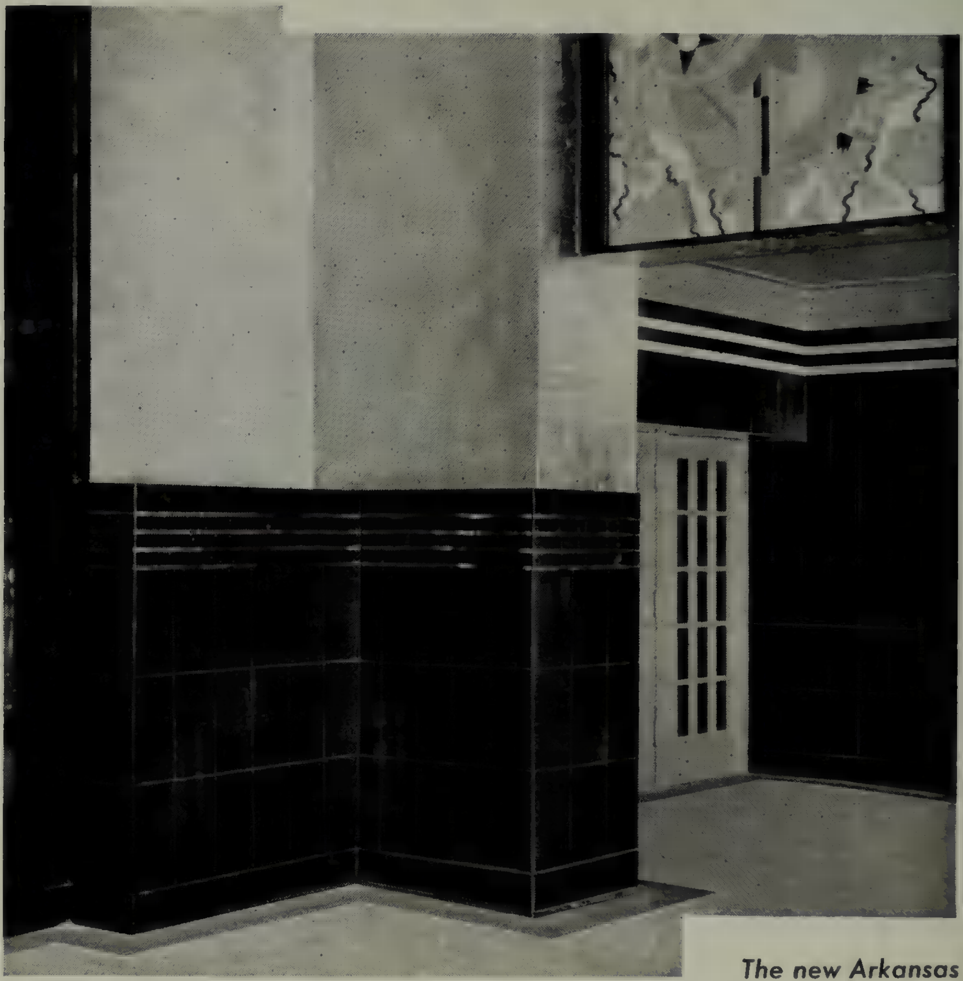
ILCO Limestone, from the proven, time-tested quarries of Indiana Limestone Company, provides the high quality limestone required for modern building.

Let us submit an estimate on the construction you are planning. Address Dept. 2268, Service Bureau, Bedford, Indiana.

INDIANA LIMESTONE COMPANY

General Offices: Bedford, Indiana *Executive Offices:* Tribune Tower, Chicago

VITROLITE crystallizes the dream of the "*Modern*"



The new Arkansas Theater, Little Rock, Ark., pictured above, has a Vitrolite lobby. Standard black ashlar wainscoting, capped by four bands of polished aluminum, forms a striking contrast to the indirectly illuminated silver leaf walls above. Architects, Petter & McAninch, Little Rock, Ark. Contractor, Gordon Walker, Little Rock, Ark.

BEAUTY? Yes, startling beauty. Combine this inherent quality of Vitrolite with its many other advantages, and the reason for the thousands of new Vitrolite installations is supplied. But Vitrolite is "friendly" to the "architect," because it crystallizes modern thought. In shape and color it is adaptable. It is in itself the very spirit of a new era in architectural conception.

If you would remain master of the clay by which you mold your dreams, familiarize yourself with Vitrolite. And Vitrolite is a lifetime material. Its satin smooth finish will not stain, craze or discolor and can be cleaned instantly with a damp cloth. It comes in a variety of beautiful colors.

VITROLITE
"BETTER THAN MARBLE"

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Where Tradition Is a Guide, Not a Master

First Baptist Church, Evanston, Ill.
Architects: Talmadge & Watson
Woodworkers: A. T. Rydell, Inc.

Tradition is a guide but not a master to those architects who have learned for themselves the merits of American Walnut in the decoration of church interiors. Just as they have forsworn the gloominess of candle-light in favor of modern lighting, they have substituted the mellower, softer beauty of American Walnut for the harshness of the materials employed by designers of the distant past.

For architects, adapting the traditional to the needs of today, find that no material so serves to embellish fundamental, structural unity as does American Walnut. No other adds those grace notes of design to the "frozen music" of a composition. American Walnut covers bareness without monopolizing attention. It glows with warm color without being ostentatious. It provides texture to a broad surface without being obtrusive. And it is equally beautiful in broad expanses or intricate carvings.

Architects contemplating the use of wood in design will find our technical consultation service of real assistance in devising patterns, panels, and finishes to meet specific situations. Even our personal service is available, gratis, to any architect.

AMERICAN WALNUT

A few important installations of American Walnut

Baptist Temple
Rochester, N. Y.

St. John's Episcopal Church
Los Angeles, Calif.

St. Thomas Church
New York City

Temple Emanu-El
New York City

B'nai B'rith Temple
Los Angeles, Calif.

South Main Baptist Church
Houston, Texas

Second Church of Christ, Scientist, Brooklyn, N. Y.

AMERICAN WALNUT MANUFACTURERS' ASS'N
Room 1741, 616 S. Michigan Ave., Chicago, Illinois

AMERICAN WALNUT

STRUCTURAL STEEL CREATED THE SKYSCRAPER

TO INDUSTRY STEEL BRINGS BRAWN

"AN INDUSTRIAL DEVELOPMENT"—IMAGINATIVE DESIGN BY HUGH FERRISS. AN ENLARGEMENT, ON SPECIAL STOCK FOR FRAMING, WILL BE MAILED WITHOUT CHARGE TO ANY ARCHITECT, ENGINEER OR BUSINESS EXECUTIVE.

STEEL is the modern beast of burden . . . long proved best fitted to shoulder the world's work. In its clean, compact sinews is equal resistance to tensile, compressive and shearing stress. Steel, the strongest building material known to man, can have no hidden weaknesses . . . it is worked and reworked at the mills, rolled and rerolled, tested and tested again.

In industrial plants, steel withstands the incessant vibration of flashing machines and the changing stresses of constantly shifting loads. It is elastic and tough. It is the only material that can be depended upon to recover fully when loads are removed or shocks cease.

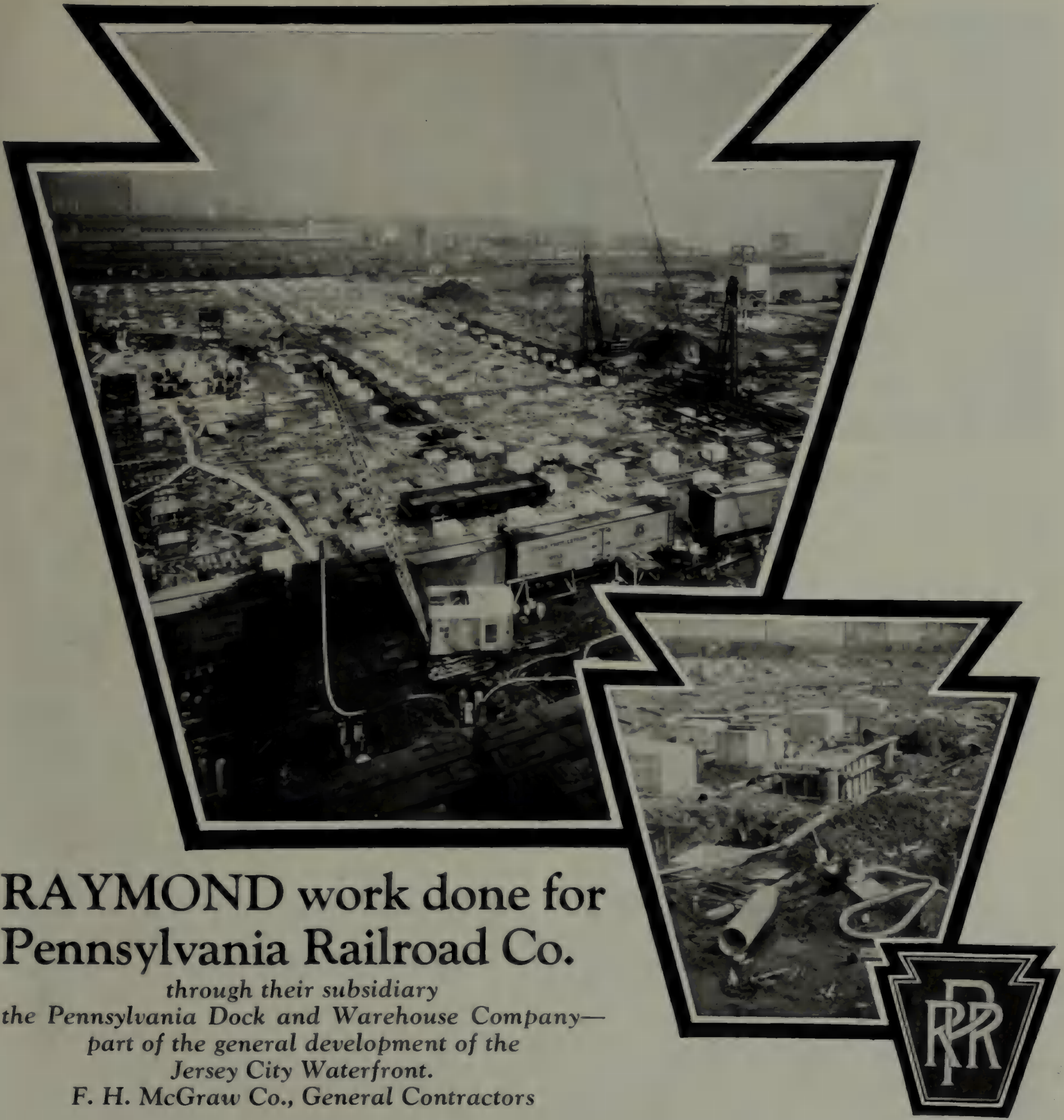
Steel offers the same great strength, resilience and permanence to small factories, to small apartment and mercantile houses, to homes, schools, and small as well as mammoth bridges. It saves building time, provides more floor space. It is most economically erected in any climate—any weather—wherever and whenever men can work.

Before building anything find out what steel can do for you. The Institute serves as a clearing house for technical and economic information on structural steel, and offers full and free co-operation in the use of such data to architects, engineers and all others interested.

The co-operative non-profit service organization of the structural steel industry of North America. Through its extensive test and research program, the Institute aims to establish the full facts regarding steel in relation to every type of construction. The Institute's many publications, covering every phase of steel construction, are available on request. Please address all inquiries to 200 Madison Avenue, New York City. Canadian address: 710 Bank of Hamilton Bldg., Toronto, Ontario. District offices in New York, Worcester, Philadelphia, Birmingham, Cleveland, Chicago, Milwaukee, St. Louis, Topeka, Dallas, San Francisco and Toronto.

AMERICAN INSTITUTE OF STEEL CONSTRUCTION

STEEL INSURES STRENGTH AND SECURITY



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- Cleaning out and cutting off pipe.
- Filling pipe with concrete.
- Pouring footings.
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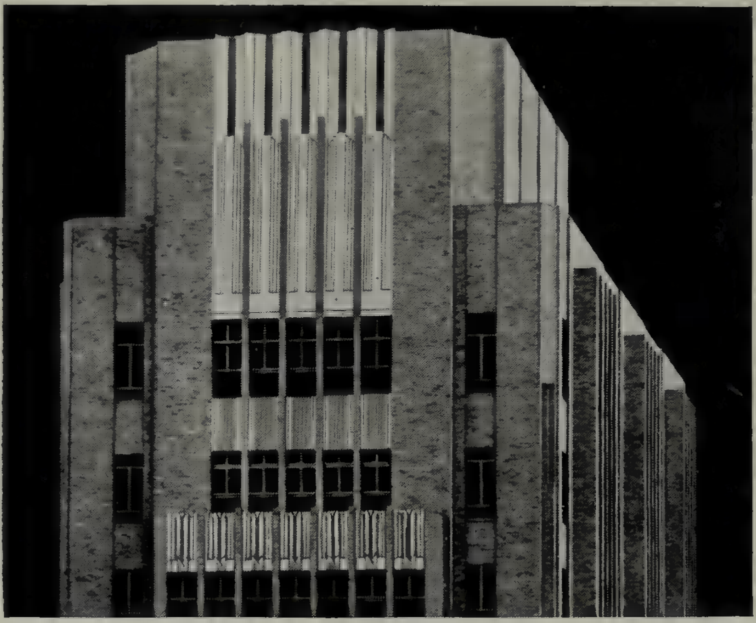

The 1616 Walnut Street Building in Philadelphia is another "Greenberg Project." Architects: Tilden, Register and Pepper, Philadelphia, Pa. General contractor: Wark and Co., Philadelphia, Pa. Sub-contractor: General Bronze Corporation, New York, N. Y.

Alcoa Aluminum clear to the top color and design

Blending into the color scheme of modern architecture, adapting themselves to the glorification of the straight line, millions of pounds of Alcoa Aluminum Alloys are now being used for decorative architectural purposes.

Alcoa Aluminum permits the architect to design and create a building whose decorative detail will endure as long as the building. Alcoa Aluminum Alloys resist corrosion; will not streak adjoining surfaces; need not be painted. They take a high polish.

In addition to these distinctive qualities, Alcoa Aluminum Alloys weigh only ⅓ as much as other commonly used metals, yet are equally as strong. Their cost is low—comparable to that of other metals not having the advantages of Alcoa Aluminum. They can be readily fabricated, in some cases more easily than old-fashioned metals.

In the case of the 1616 Walnut Street Building, there are 149 typical spandrels cast from No. 43 Alcoa Aluminum Alloy, having a deplated and high-lighted finish. These, blending with the facade, carry the line movement clear to the top of the building. There, 20 parapet spandrels, also cast of No. 43 Alcoa Aluminum Alloy with satin finish, bring a distinctive note of color and design to the top of the tower.

Alcoa Aluminum is widely used, not only for spandrels, but for cornices, coping, cresting, sills,

Spandrels carry the line movement , , , finishing in a distinctive note of

and other decorative purposes. Alcoa Aluminum building specialties such as windows, skylights, hollow metal doors and trim, lighting fixtures, mail chute equipment, ventilators, conduo base, mop strips, et cetera, are regularly fabricated by nearly 200 leading manufacturers.

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To meet the numerous demands for structural stability, Alcoa Aluminum Alloys are available in various tensile strengths. In each of our offices we have competent representatives who have a wealth of experience as to the decorative and structural uses of each of the special Alcoa Aluminum Alloys. The services of these representatives are available to the designer and specification writer. May we urge you to accept this free co-operation in designing buildings in which Alcoa Aluminum will form a part? Address ALUMINUM COMPANY *of* AMERICA; 2467 Oliver Building, PITTSBURGH, PENNSYLVANIA.

ALCOA

ALCOA ALUMINUM

FOR SMART INTERIORS

Harry Sternfeld *favors* the wood whose charm is ageless

TIDEWATER RED CYPRESS (Coast Type) yields a glowing beauty which seems only to mellow with age. Fashionable today, an interior of this Wood Eternal will not have lost its lovely distinction ten . . . twenty . . . even a hundred years from now.

Architects and interior decorators throughout the country are employing Tidewater Red Cypress in an ever-increasing number of homes.

Like Mr. Harry Sternfeld, of Philadelphia, who has long sponsored this beautiful wood, they find that its exquisite grain holds a charm rarely equaled for panels, doors, beams and trim.

They also find that no other material is quite so versatile. Stained or varnished, painted or charred, sand-etched or left in its natural state, Tidewater Red Cypress is always richly warm.

A Book of Interiors—sent free

In this illustrated book of interesting interiors, designed by noted architects, you will see *how* and *why* Tidewater Red Cypress is being used in greater quantities today than ever before.

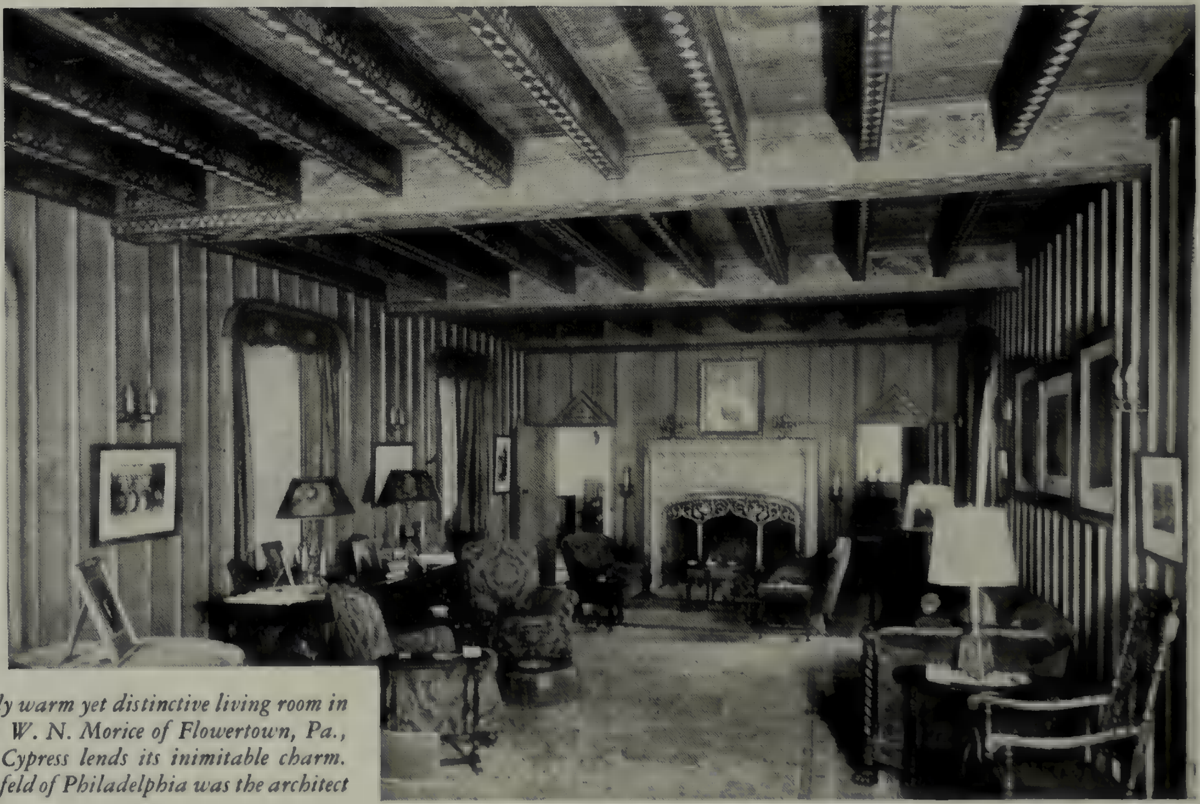
We shall gladly send you a complimentary copy. Address the Southern Cypress Manufacturers' Association, Jacksonville, Fla.

If your dealer is not stocked with Tidewater Red Cypress, he can get it for you quickly—or you can write direct to any of the Association Mills listed below.

TIDEWATER RED CYPRESS

(COAST TYPE)

THE WOOD ETERNAL



To this intimately warm yet distinctive living room in the home of Mr. W. N. Morice of Flowertown, Pa., Tidewater Red Cypress lends its inimitable charm. Mr. Harry Sternfeld of Philadelphia was the architect

Quaker Photo Service

This advertisement is published by the following members of the Southern Cypress Manufacturers' Association, Jacksonville, Fla.:

J. Ray Arnold Cypress Co., Groveland, Fla.
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» » » » » PERMANENTLY BEAUTIFUL

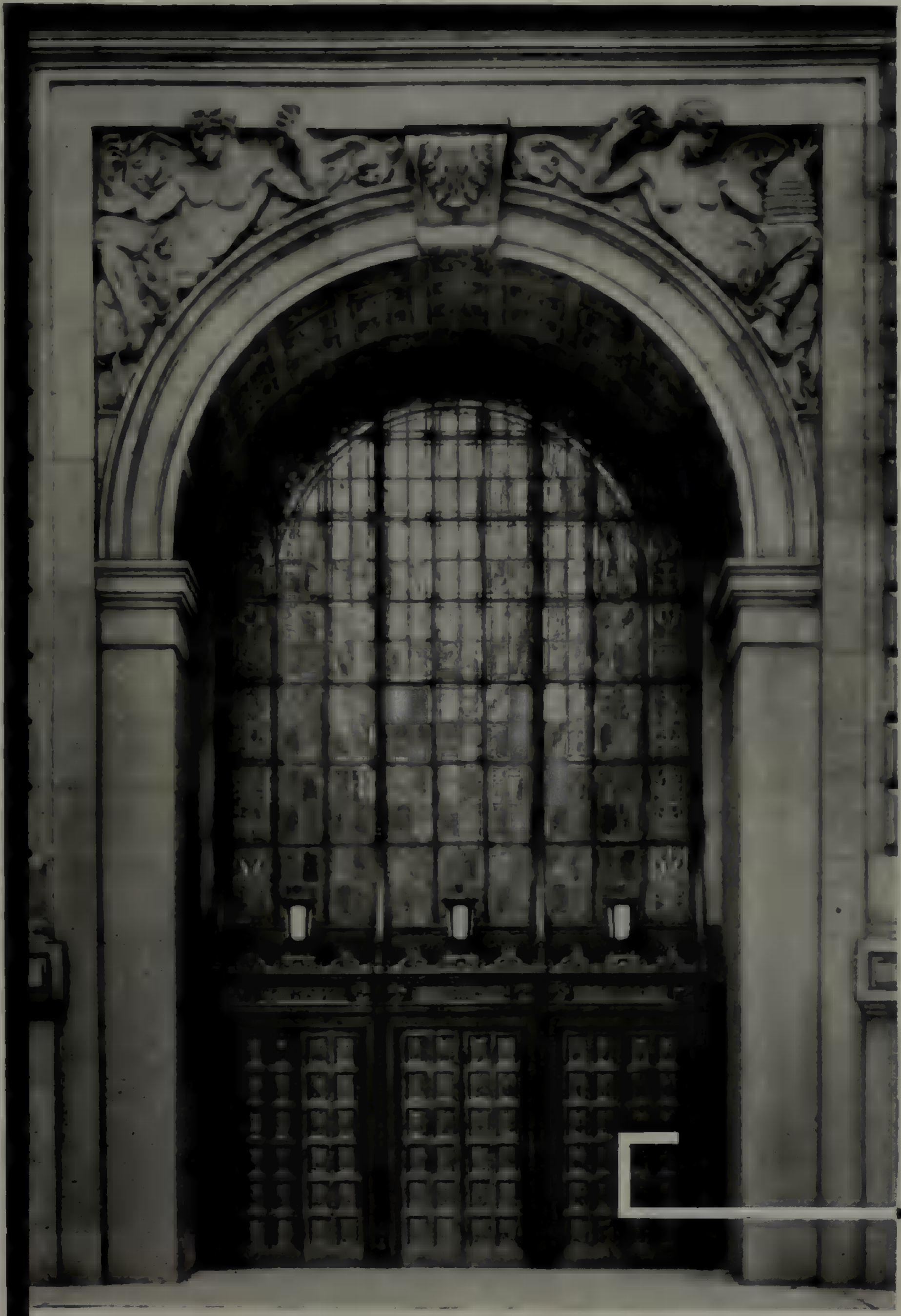
This doorway of cast BRONZE

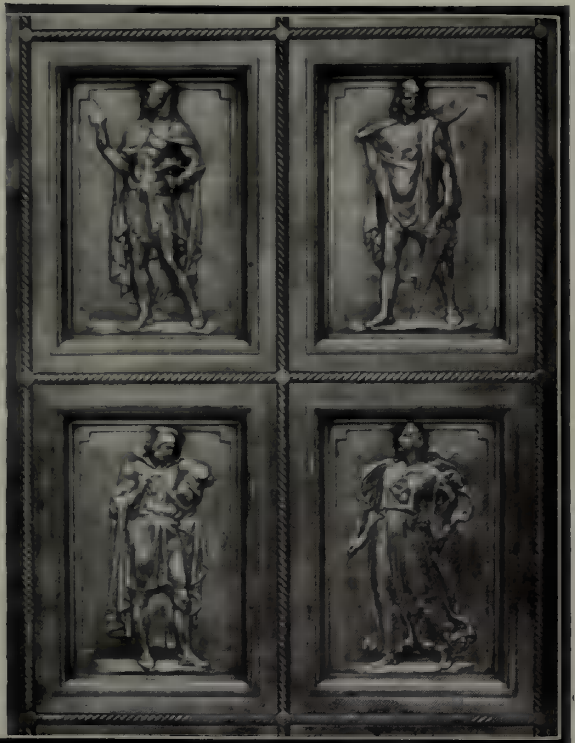
THE FIDELITY-PHILADELPHIA TRUST BUILDING

The doorways of the three entrances again show how faithfully bronze can represent the architect's and sculptor's creation. The bronze doorways are rich in sculptural detail—yet the total effect is architecturally harmonious.

The doors are modeled in low relief and finished in medium statuary patine. The entrance screen above the doorways is ornamental bronze and imported cathedral glass—specially treated to subdue light. The leading is repoussed and gold leafed. The colonettes, cheneaux, and lanterns are also cast in bronze and modeled in low relief

Architects	Simon & Simon
Sculptors	Piccirilli Bros.
Contractors.	Irwin & Leighton





Above is shown a detail from the bronze doorway. In 24 panels is depicted an allegory of the evolution of civilization and commerce.

"DISTINCTIVE PRODUCTIONS IN ALL METALS"

GENERAL BRONZE CORPORATION

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NORTH
WEST EAST
SOUTH
UP *and* DOWN

Chase Brass & Copper Co., Cleveland

these PARTITIONS are INTERCHANGEABLE

NEW and more fully standardized Sanymetal designs make possible complete interchangeability of all units—door or panel sections. The new "Vertical and Horizontal Assembly" assures perfect flexibility up or down, or in any direction. Think what this means in terms of movability for future layout changes! No waste—no re-cutting. No lost time! Genuine, permanent flexibility for your office arrangement!

These new Sanymetal Steel Partitions are distinguished by harmonious, symmetrical lines, and richly finished in plain colors or faithful reproductions of wood grain.

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Easier erection. Greater movability. Finer appearance. Sound-and-fire resistance.

Let a Sanymetal representation *bring home* these points to you.

Sanymetal steel office and factory partitions are made in four types for every purse and purpose. Sanymetal also builds steel toilet, shower and dressing compartments, and hospital cubicles. Communicate with Partition Headquarters.

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RUBEROID GIVES PROMPT SERVICE ON ALL BUILT-UP ROOFING SPECIFICATIONS

The Ruberoid Co. gives prompt service to architects from the time they refer to Sweet's until the roof is bonded. This service covers all the popular types of built-up roofs—Asbestos, Coal Tar Pitch and Felt, and Asphalt.

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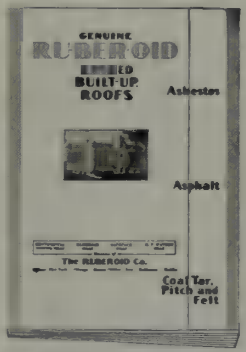
Bonded roofs provide the architect, builder and owner with a guarantee both as to workmanship and material for 10, 15 or 20 years, according to the specification used. These roofs are applied only by approved roofing contractors of known ability, and the guarantee is backed by a National Surety Bond.

For your convenience, you will find a complete catalogue of Ruberoid Built-up Roof Specifications in 1931 Sweet's. Should you desire supplementary information, or face a roofing problem resulting from unusual conditions, our Engineering Department is always glad to be of help. Simply write or phone any office listed below. You will always receive prompt service.



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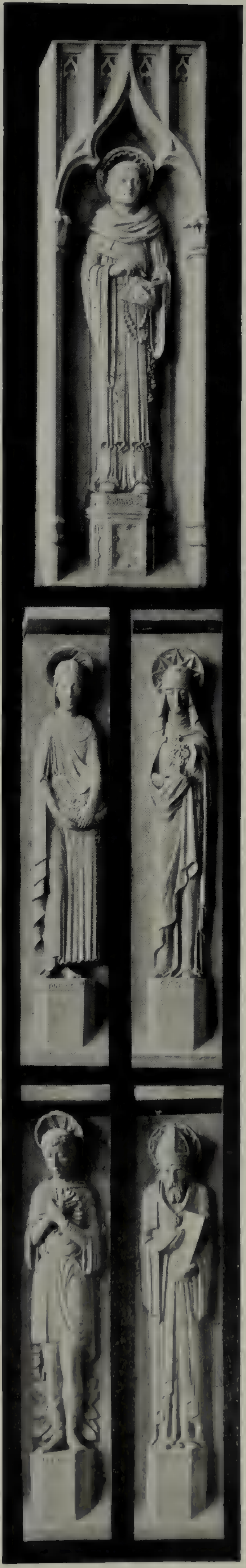


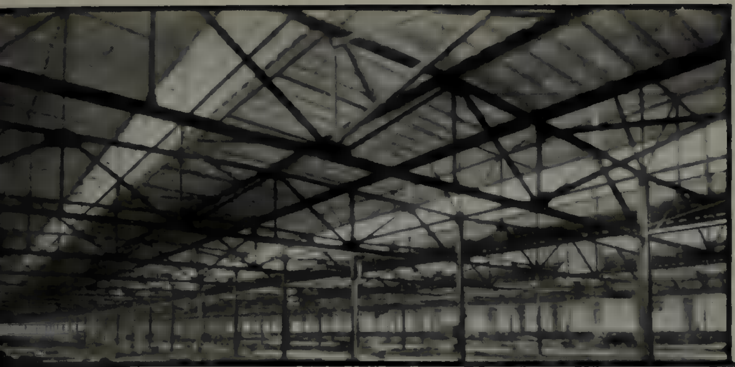
LIKE the musician to whom life is a symphony and the painter to whom the world is a pageant, the able designer constantly aspires to produce work worthy of his vision. In doing so, he naturally seeks a sympathetic medium, one that will faithfully and truly respond to every creative demand.

Northwestern Terra Cotta fully meets this reasonable requirement. It is the perfected product of fine craftsmanship, scientific research and modern equipment. It offers the architect a freedom of expression that is virtually unlimited. In form, texture, surface treatment and color, it presents a medium for creating lasting beauty that has been appreciated and employed by great artists from the time of the Della Robbias to the present day.

The accompanying illustrations show part of a magnificent altar in polychrome terra cotta for Church of St. Thomas Aquinas, Chicago, designed by Henry Schmidt and manufactured by The Northwestern Terra Cotta Company.

THE NORTHWESTERN TERRA COTTA COMPANY

DENVER · CHICAGO · ST. LOUIS



Bendix Aviation Building, South Bend, Indiana. Below—roof deck *ready for composition covering.* The entire roof of Featherweight slabs was erected in winter—an area of over 300,000 sq.ft. And this expanse represents but half the area of Federal roofs in use by this company!

LAYING a Concrete Roof in Zero Weather.

It is done quickly and easily under *any* conditions, because precast slabs come to the job ready to be hoisted from box-cars and placed directly on the steel roof purlins. The building gets under cover on time — the composition covering may be applied immediately thereafter.

The Featherweight Concrete slab is alone amongst roof constructions in ultimate value — a weight as low as *10 lbs. per sq. ft.*—insulating qualities—permanence—fire safety—freedom from all maintenance.

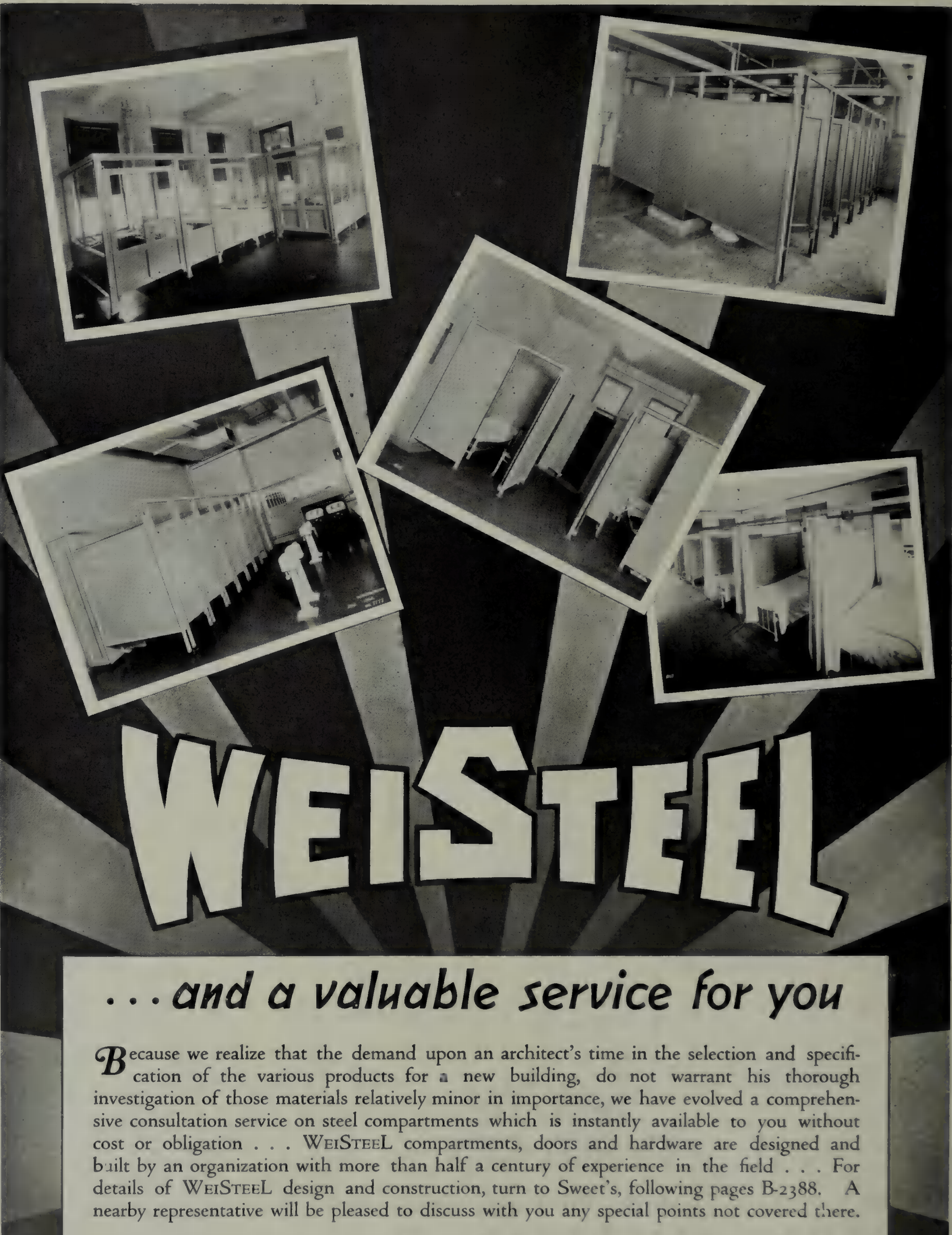
Many of the country's prominent industrial, public utility, railroad and public buildings are protected by this roof. "Catalog and Roof Standards" on request.

Featherweight Concrete
INSULATING ROOF SLABS

Made, Laid and Guaranteed by

FEDERAL-AMERICAN CEMENT TILE CO.

Executive Offices: 608 South Dearborn Street - - - - - - Chicago
Plants Near CHICAGO - NEW YORK - PITTSBURGH - BIRMINGHAM
FOR OVER A QUARTER CENTURY



. . . and a valuable service for you

Because we realize that the demand upon an architect's time in the selection and specification of the various products for a new building, do not warrant his thorough investigation of those materials relatively minor in importance, we have evolved a comprehensive consultation service on steel compartments which is instantly available to you without cost or obligation . . . WEISTEEL compartments, doors and hardware are designed and built by an organization with more than half a century of experience in the field . . . For details of WEISTEEL design and construction, turn to Sweet's, following pages B-2388. A nearby representative will be pleased to discuss with you any special points not covered there.

HENRY WEIS MANUFACTURING COMPANY, INC.
Elkhart, Indiana

North Vestibule in the Nebraska State Capitol, Lincoln, Nebraska
Bertram G. Goodhue, *Architect*
and
Bertram G. Goodhue Associates, *Continuing Architects*

AN ACOUSTIC INSTALLATION

MASONRY VAULTED CEILING (SUPPORTING ROOF) WITH ACOUSTIC TILE SOFFIT AND CERAMIC DECORATION IN FOURTEEN DIFFERENT COLORS AND GOLD

CONSTRUCTED AND MANUFACTURED BY

R. GUASTAVINO COMPANY

40 COURT STREET, BOSTON, MASS. 225 WEST 34th STREET, NEW YORK, N. Y.

R. GUASTAVINO CO. OF CANADA, LTD., New Birks Building, Montreal, P. Q.

Von Duprin

Self-Releasing Fire and Panic Exit Latches

Profits from the Superfine

Sweet's
Pages C3892-C3896

Like other specialties entering into the construction of a building, panic devices offer the architect the choice of specifying an article which is low in first cost or one which is higher priced, but which, because of freedom from maintenance expense, costs far less over the life of the building.

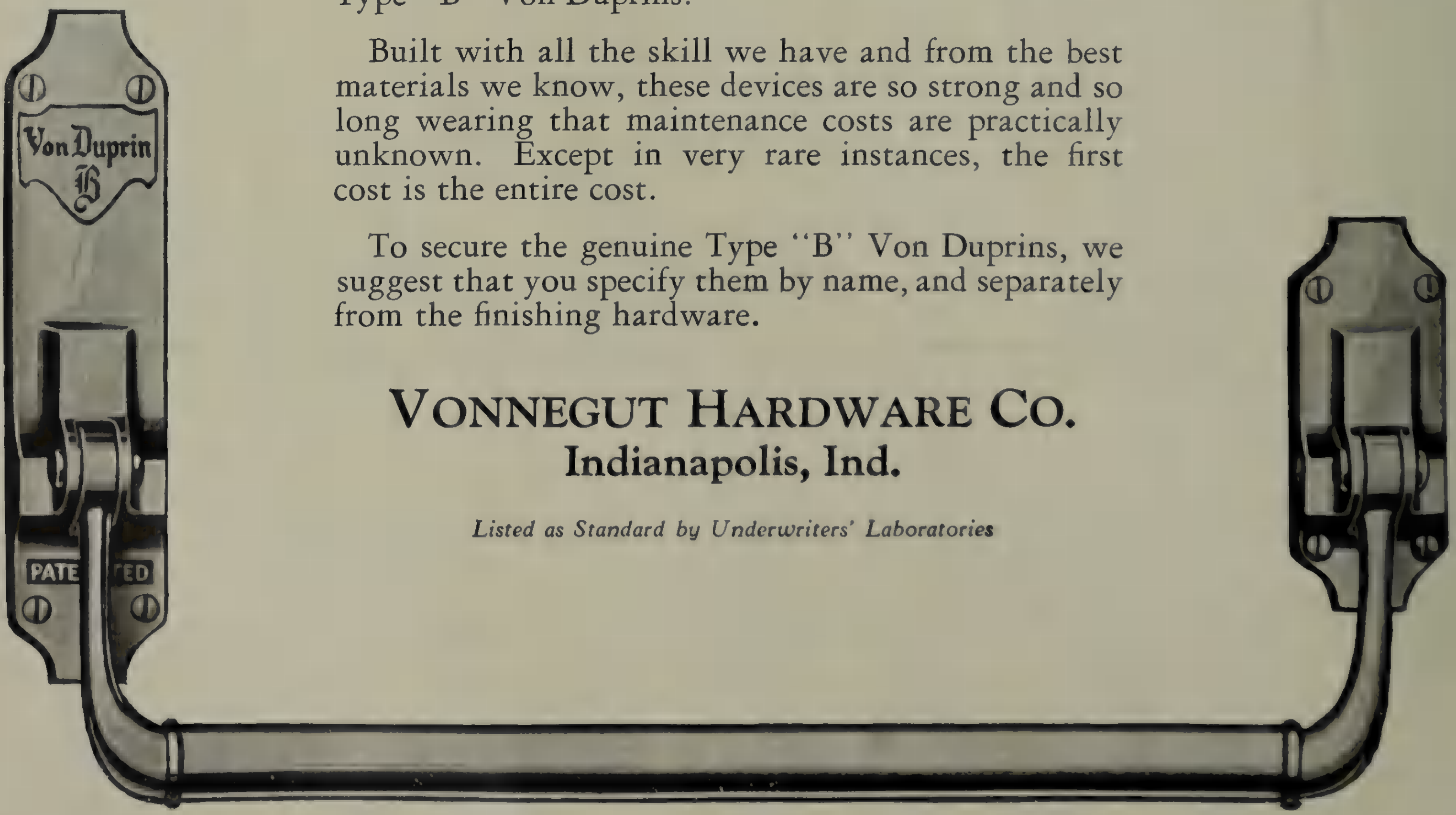
Many architects believe that any building except a temporary structure deserves panic devices which are as nearly free as possible from upkeep and repair expense. It is for these men that we make the genuine Type "B" Von Duprins.

Built with all the skill we have and from the best materials we know, these devices are so strong and so long wearing that maintenance costs are practically unknown. Except in very rare instances, the first cost is the entire cost.

To secure the genuine Type "B" Von Duprins, we suggest that you specify them by name, and separately from the finishing hardware.

VONNEGUT HARDWARE CO.
Indianapolis, Ind.

Listed as Standard by Underwriters' Laboratories



Pardon my disguise!

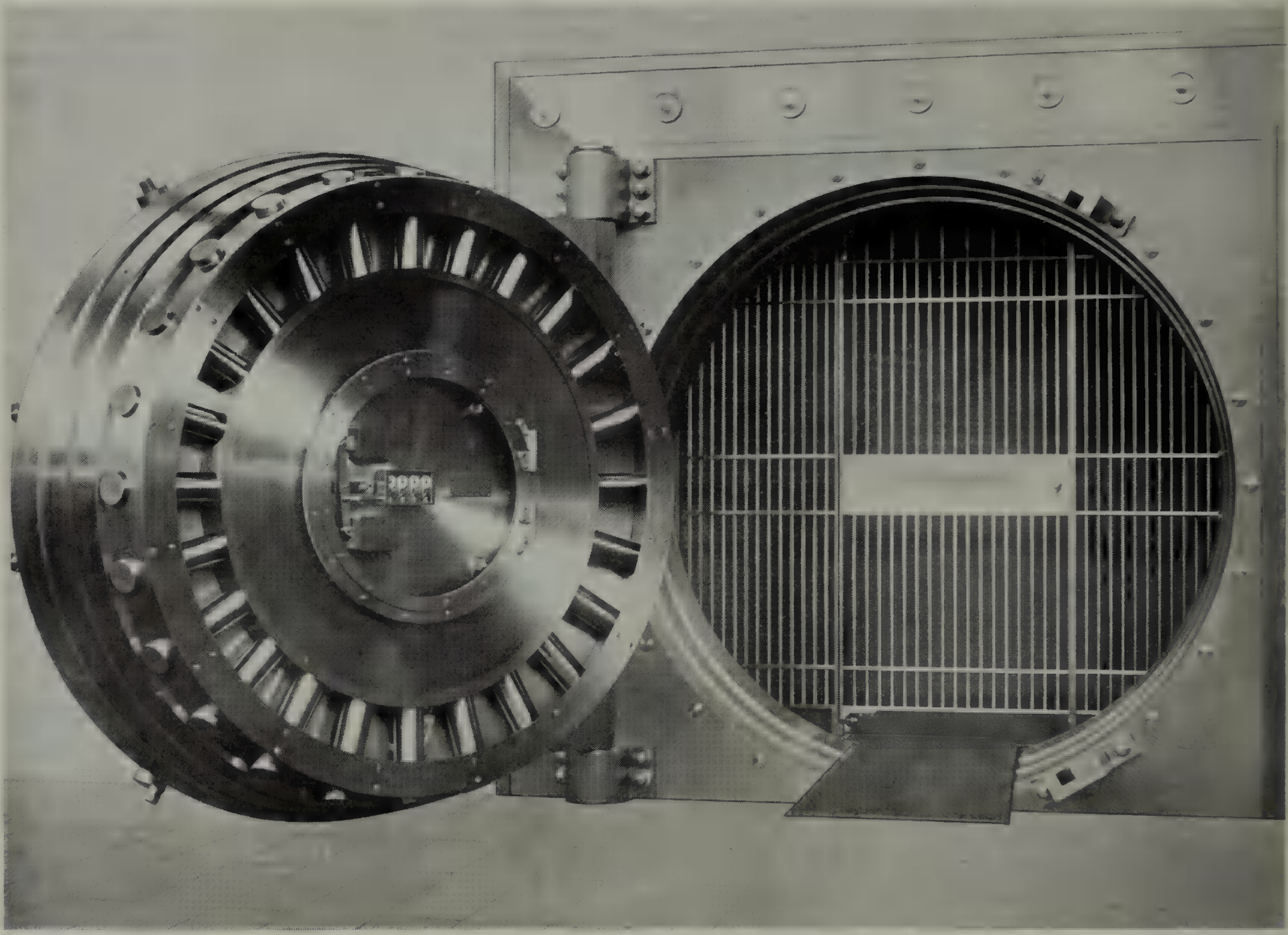
PERHAPS A CHAMELEON has the best of reasons for trying to "look like what he ain't," but it *does* seem odd every now and again to see a building—designed in the modern style with the sweeping vertical lines and large expanses of wall that are so effective in the snowy plaster model—carried out in stone that lacks uniformity in tint and tone. How much more striking it might be if the stone were one whose warm, creamy lightness was absolutely uniform. The greatest recommendation of Victor Select and Standard Buff Limestone is its uniform, creamy tone—there are no checkerboard variations in tint and color to camouflage structural lines and offsets, kill carving detail and reduce the effectiveness of modern architectural design. Furthermore, the supply of Victor Buff Limestone is virtually unlimited—an important point where the building of today will tomorrow be surrounded by others that must necessarily be in harmony with it.

Represented in the new 4-volume
Sweet's for 1931, Vol. A, page 618

VICTOR OOLITIC STONE CO.
Bloomington, Indiana

★

This vault adds Distinction to its Building



This giant door will give you an idea of the fine craftsmanship of Diebold. It weights fifty tons, yet swings on its crane hinges as easily as any ordinary door

No one would think of building a platinum setting around an imitation stone. Likewise no one would think of designing a fine building around anything but the best of vaults. The Diebold Vault, in workmanship, finish, in every way, is as perfect a vault as money can buy. Specify "Diebold Vault" in the plans for your next building. They are designed in a size and a style for every conceivable need.

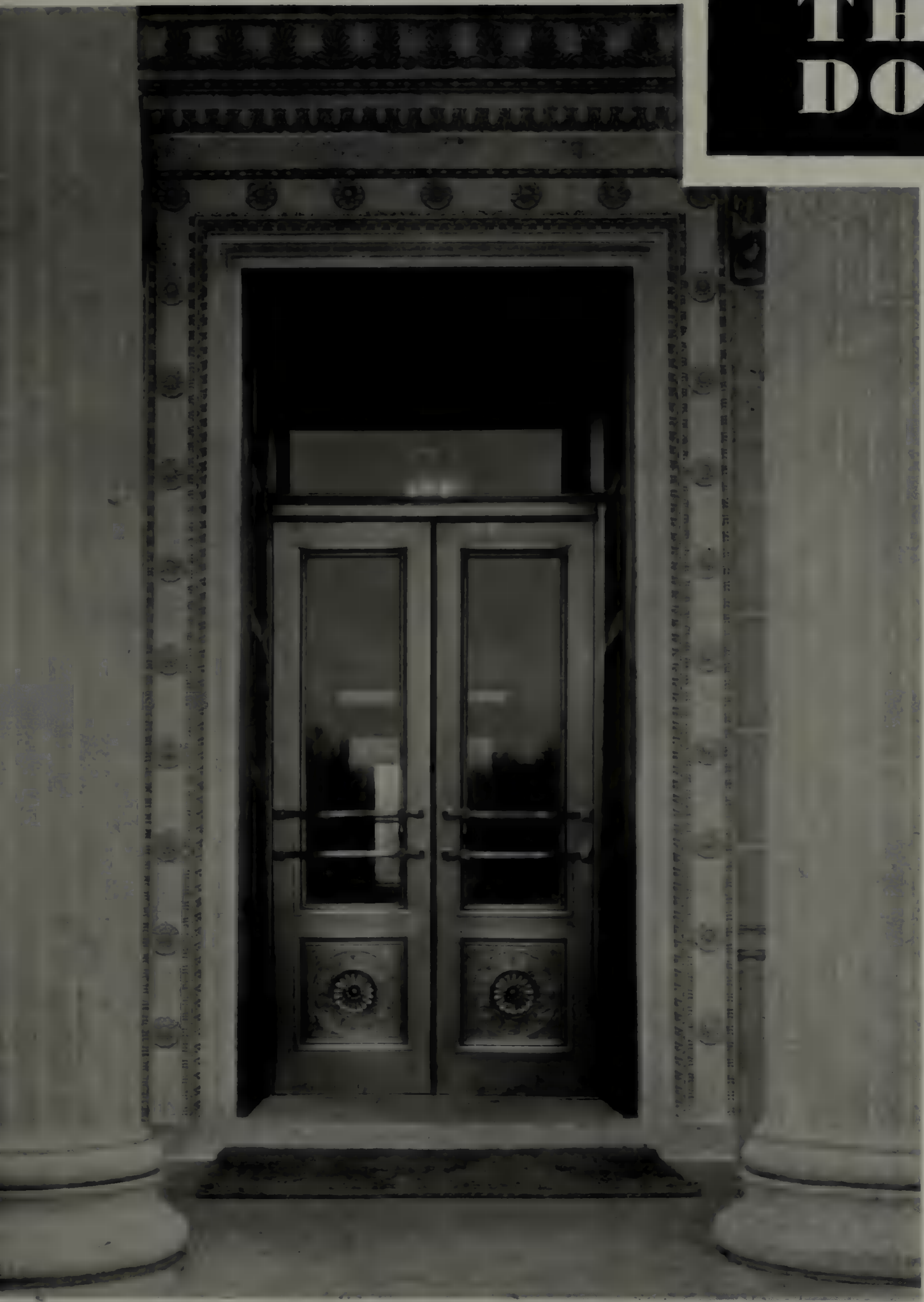
Diebold Safe and Lock Company

Canton, Ohio

SEVENTY YEARS OF BANK SERVICE

Entrance—Administration Building, Lakewood Cemetery Association, Minneapolis. Ernest Kennedy, Architect.

Specify THORP DOORS



FUNCTION must always control design. Here we find simple dignity, strength wrought into the doors that form the entrance to the Administration Building of the Lakewood Cemetery. Doors and frames are of hollow bronze fashioned by Thorp. Thorp craftsmanship may be depended on always to give tangible expression to the design which the architect visions.

THORP FIREPROOF DOOR CO. ***Minneapolis, Minnesota***

Comfort can go sky-high

Even in top-floor offices, all weather is good weather when roofs are insulated with cork . . . . .

Sometimes a bird's-eye view is necessary to remind one of the importance of roofs—and roof insulation.—Ewing Galloway photo.

TWO days after a heavy snowstorm, an airplane ride over your city will give you a true census of adequately insulated buildings. Their roofs bear witness! Where heat is escaping, the snow already has melted. Only where adequate insulation has checked this unwarranted heat loss, will snow still blanket the building.

But there are other sources of evidence. The owner of the building. His superintendent. His top-floor tenants.

Where Roof Insulation is Inadequate

The owner contributes: "That heating plant of mine just eats up fuel." His superintendent growls as he gets another call for more heat and mutters that "the furnace can't be stretched." And top-floor tenants kick about high rents for offices that are too cold in winter and too hot in summer.

All this in the building that is inadequately insulated.

Where Cork Insulates the Roof

There's a different story in the building insulated with Armstrong's Corkboard. Now heat stays where it belongs. There is no strain on the heating unit. Top-floor offices are pleasant and valuable all year 'round. Fuel dollars are saved. The owner and his superintendent are well pleased. The tenant is contented and comfortable.

And the architect knows he has done his work well. He has used Armstrong's Corkboard—the permanently reliable insulation. It resists moisture. Consequently it always retards the passage of heat—to the inside or the outside. We will be pleased to send you data that covers the subject of roof insulation completely. Just address: Armstrong Cork & Insulation Company, 901 Concord Street, Lancaster, Penna.

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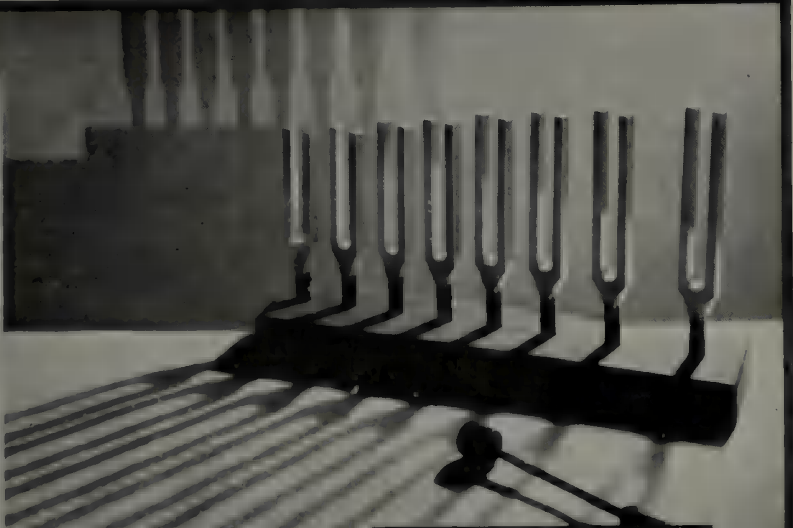
Armstrong's Corkboard Insulation

for the roof of every building



It is now possible for USG acoustical experts to determine by scientific methods the cause and effect of various noises, tones and pitches, as well as measuring accurately the efficiency of different methods and materials for controlling sound.

•

2000 Lincoln Park West Building, Chicago (McNally and Quinn, Architects). The U S G System of Sound Insulation prevents the transmission of noise from one apartment to another.

Noise from pianos, radios, late parties, etc., can be prevented from bothering occupants of adjoining suites by employing the USG System of Sound Insulation.

At Your Service on any phase of Architectural Acoustics

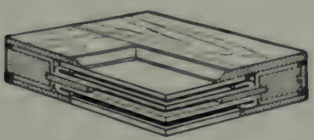
A Message to Architects
from the
United States Gypsum Company

• • • •

WITH the growing agitation for noise abatement and the increasing desire for comfortable noise levels in modern buildings of all kinds, many architects have expressed a need for reliable counsel on all phases of architectural acoustics. To meet this situation, the United States Gypsum Company has developed a complete acoustical service.

The USG service includes a competent staff of experts capable of advising architects on any problem of sound control. The creation of a great variety of scientific materials and methods to control noise, and the maintenance of skilled installation crews, enables us to predict definite results and assume full responsibility for them in every assignment which we undertake.

Where architects and their clients wish to prevent the transmission of objectionable noises from one room or floor to another, the USG System of Sound Insulation meets all requirements. It is a practical method of floor, wall, ceiling and door construction, scientifically designed to confine noise to the room of its origin. The cost is surprisingly low—usually amounting to less than 1% of the cost of the building.

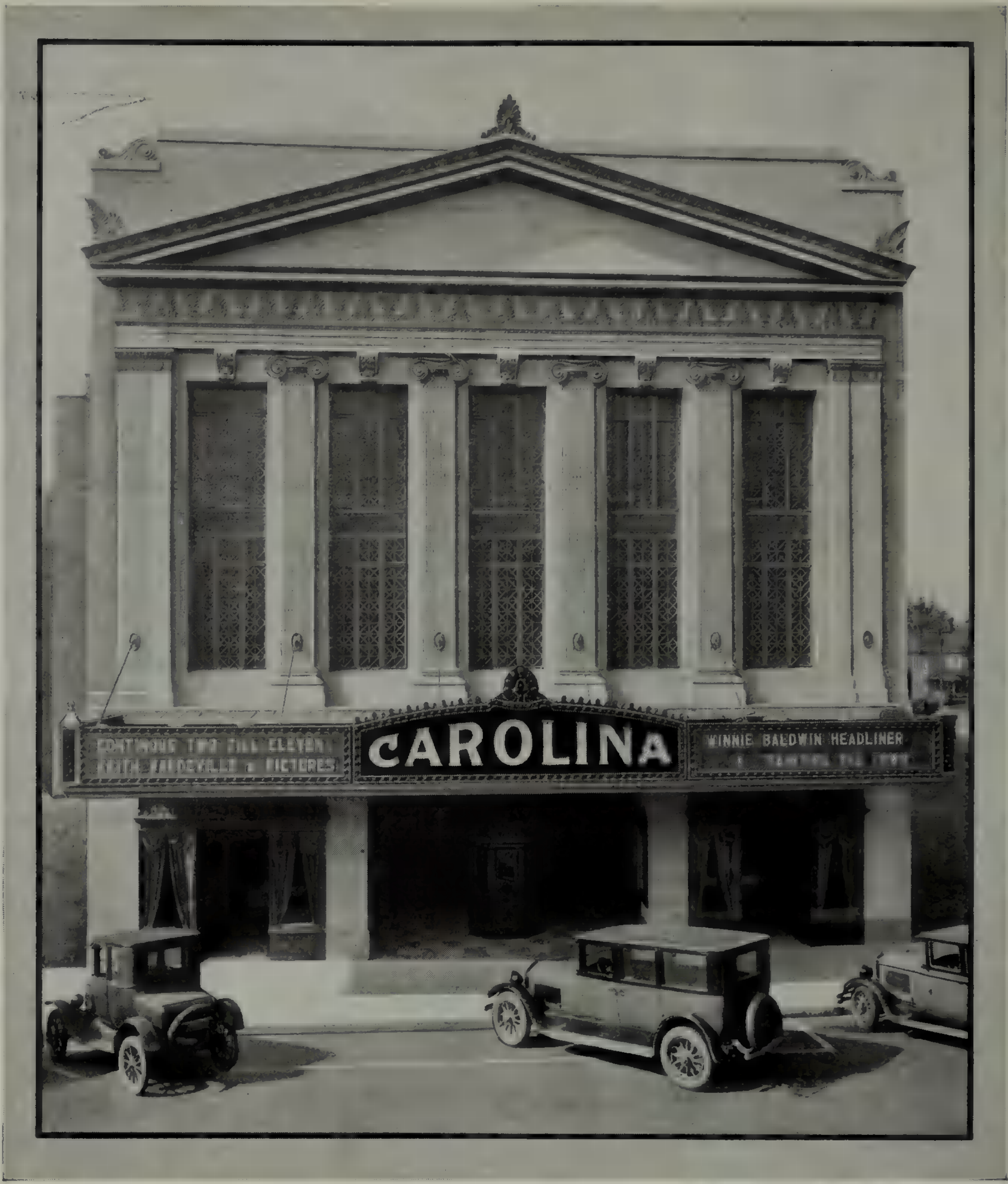


Detail of USG Sound Insulative Door. This door prevents the transmission of sound from room to room.

Where it is desirable to reduce noise levels or to provide proper hearing conditions by means of sound absorption, Acoustone, the USG acoustical tile, has been used with great success.

Our complete facilities in architectural acoustics are at your service. For further information or for a consultation with one of our sound control experts write to us. Please address the United States Gypsum Company, Dept. 4312, 300 West Adams Street, Chicago, Illinois.

USG SYSTEM *of* SOUND INSULATION



Carolina Theatre, Greensboro, N. C. James M. Workman and J. H. de Sibour, Architects

CRITTALL CASEMENTS IN KEITH THEATRE COMBINE BEAUTY AND UTILITY

THE CAROLINA—a Keith Theatre in Greensboro, N. C.—furnishes another interesting example of the use of Crittall Windows. In that building, Universal Leaded Casements were employed most effectively—the installation contributing not only to the beauty of the facade but also providing light and ventilation for floor space which could not otherwise have been utilized.

In institutional and office buildings, too, Crittall Casements are extensively used today. A wide variety of types, sizes and designs permits a practically unlimited range of application. Three separate and complete lines are offered. Stanwin and Norman Casements are available in standardized units; Universal Casements are custom-built to the architect's own specifications. All are backed by the guarantee of the world's largest manufacturer of metal casement windows.

Crittall's complete catalog is in Sweet's—pages A-1131 to A-1200. Refer to that section for details and specifications on the complete line of Crittall Casements. Upon request, we will gladly furnish any special information required.

CRITTALL CASEMENT WINDOW COMPANY
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STANWIN CASEMENTS · NORMAN CASEMENTS · UNIVERSAL CASEMENTS

CRITTALL CASEMENTS

FOR WATER REPELLENT MORTAR

WHEN Brixment is used, no waterproofing admixtures are necessary to produce a water-repellent mortar.

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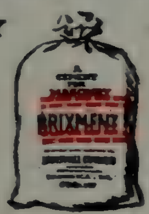

Looking back thru the year 1930 upon the more outstanding DAHLSTROM INSTALLATIONS

THE DAHLSTROM METALLIC DOOR COMPANY, *(Established 1904)* **JAMESTOWN, NEW YORK**

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WITH OFFICES AND REPRESENTATIVES IN PRINCIPAL CITIES

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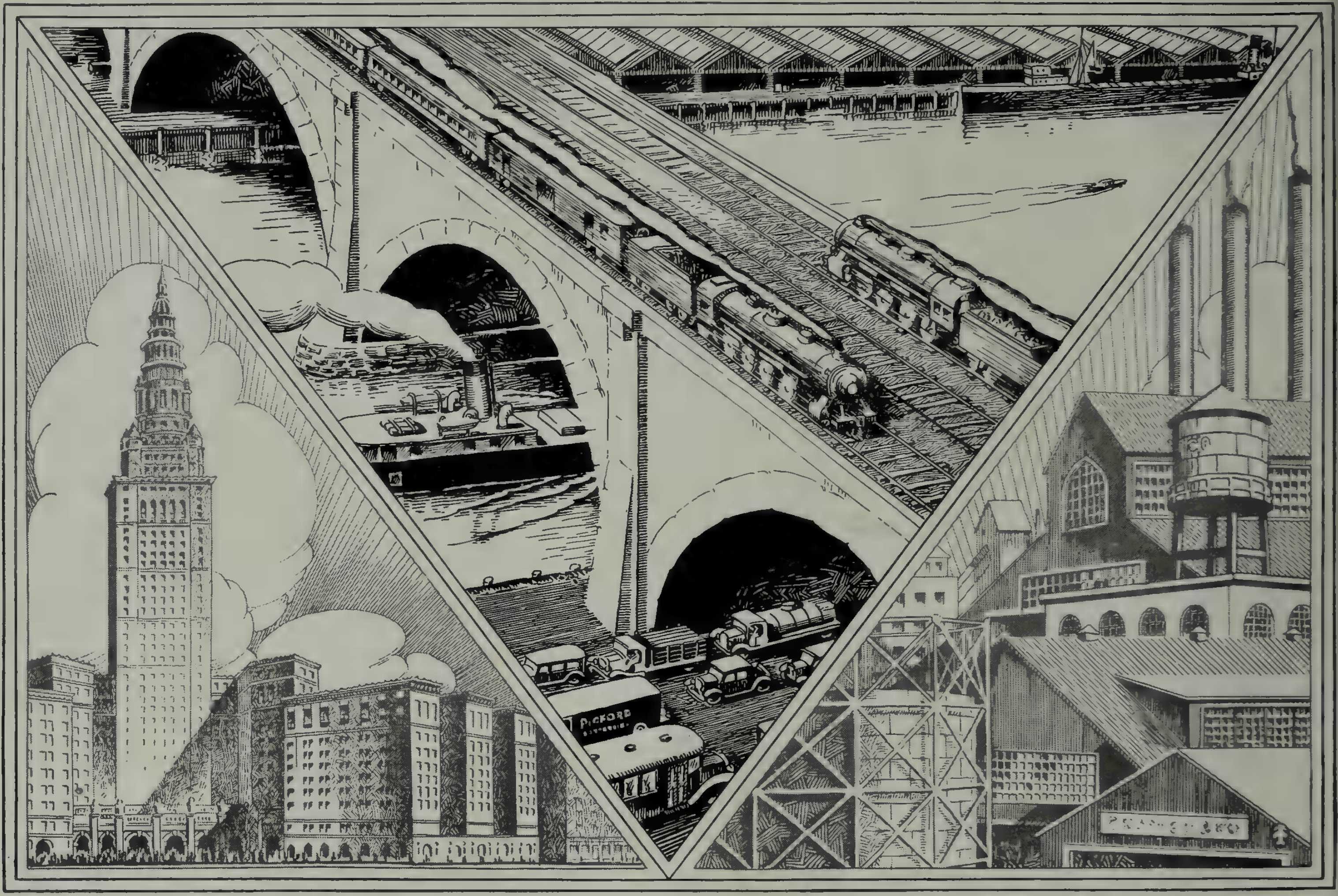

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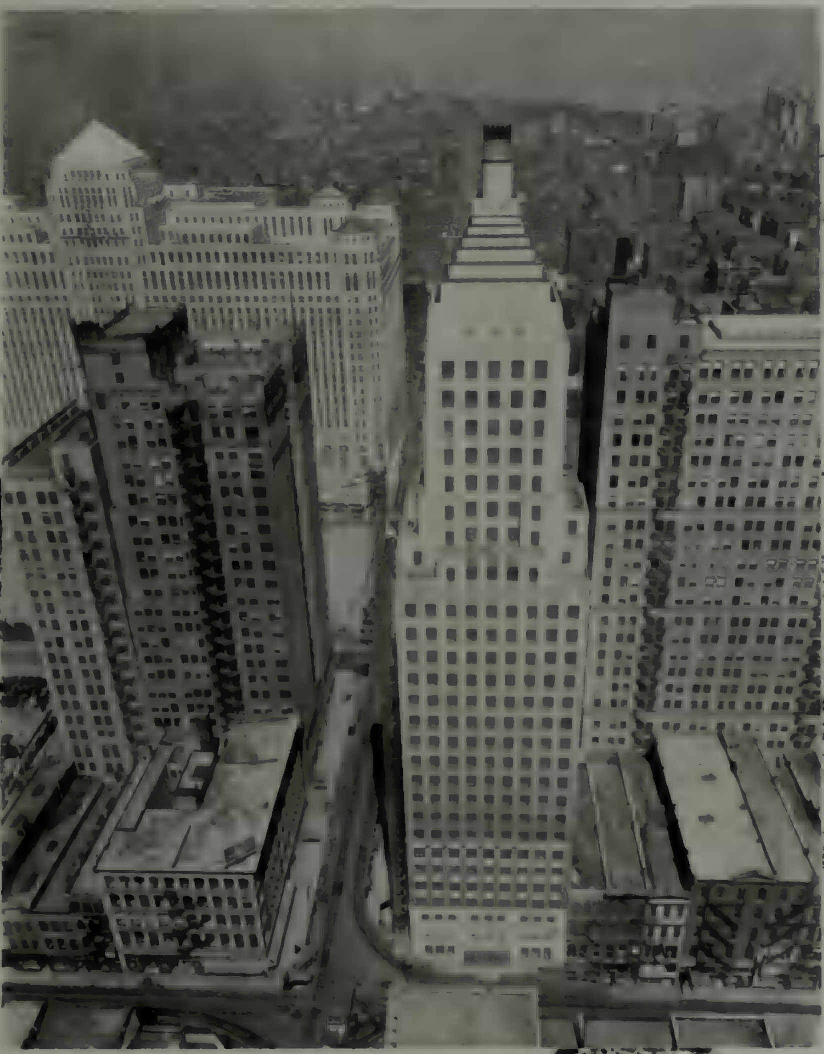

TWO-O-ONE NORTH WELLS BUILDING, CHICAGO

Thielbar & Fugard, Chicago, Architects
Matthew Bros. Mfg. Co., Inc., Cabinet Contractor
J. B. Noelle Company, Painting Contractor

PRATT & LAMBERT *Varnish Products*

ANOTHER towering structure of 32 stories has just been added to a conspicuous group in Chicago — Two-O-One North Wells Building. Like other outstanding structures in this area, the interior has been finished with Pratt & Lambert Varnish Products, including Vitraloid Lacquer and Lyt-all, the Universal Wall Coating. Vitraloid Lacquer, a durable, instantly-dry nitrocellulose material, is invaluable where time is a factor in the finishing of large architectural projects. Lyt-all is ideal for all wall work where superior results must be secured economically. Ask the nearest P&L Architectural Service Department for information on these products.

PRATT & LAMBERT - Inc., 108 Tonawanda Street, Buffalo, N. Y. (Phone Delaware 6000); 3301 38th Avenue, Long Island City, N. Y. (Phone Stillwell 5100); 320 West 26th St., Chicago, Ill. (Phone Victory 1800). Canada: 28 Courtwright Street, Bridgeburg, Ontario.

"Save the surface and you save all" *Paint & Varnish*

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Truscon offers in its steel windows some of the finest examples of modern steelcraft. Their distinctive superiority is evident in design, materials, workmanship and equipment. So efficiently are they manufactured that their unusual quality is available at moderate cost.

TRUSCON DOUBLE-HUNG
Steel Windows, Model No. 28

(Shown Below)

Galvanized steel used throughout. Unit frames solidly welded at corners. Special, solid cold rolled sections for sash rails. Deep rigid sill sections. Spring bronze weatherstripping. High quality hardware. Convenient application of screens. Trim, clean cut lines. Fire protection, permanence and easy operation. Furnished in standard units, or in combinations to meet all practical requirements.

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Built of heavy sections of copper bearing steel with drips of KA-2 Enduro rustless steel. Flat double contact throughout of not less than ⅜-inch. Solid bronze hardware of improved design. Furnished to open out or in, in complete units with single or double sash, transoms and hopper vents. Glazing may be either on outside with putty or on inside with putty or special hot rolled glazing beads.

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(Shown Above)

Extremely simple operation. Movement of lower sash controls upper sash, opening all sash or only lower or upper sash. No window poles required. Shades on open sash act as awnings. Ample ventilation without draughts and diffused daylight without sun glare. Constructed of heavy channel sections welded at all joints. Flat double contact weathering. Units of two or three sashes furnished in various standard sizes.

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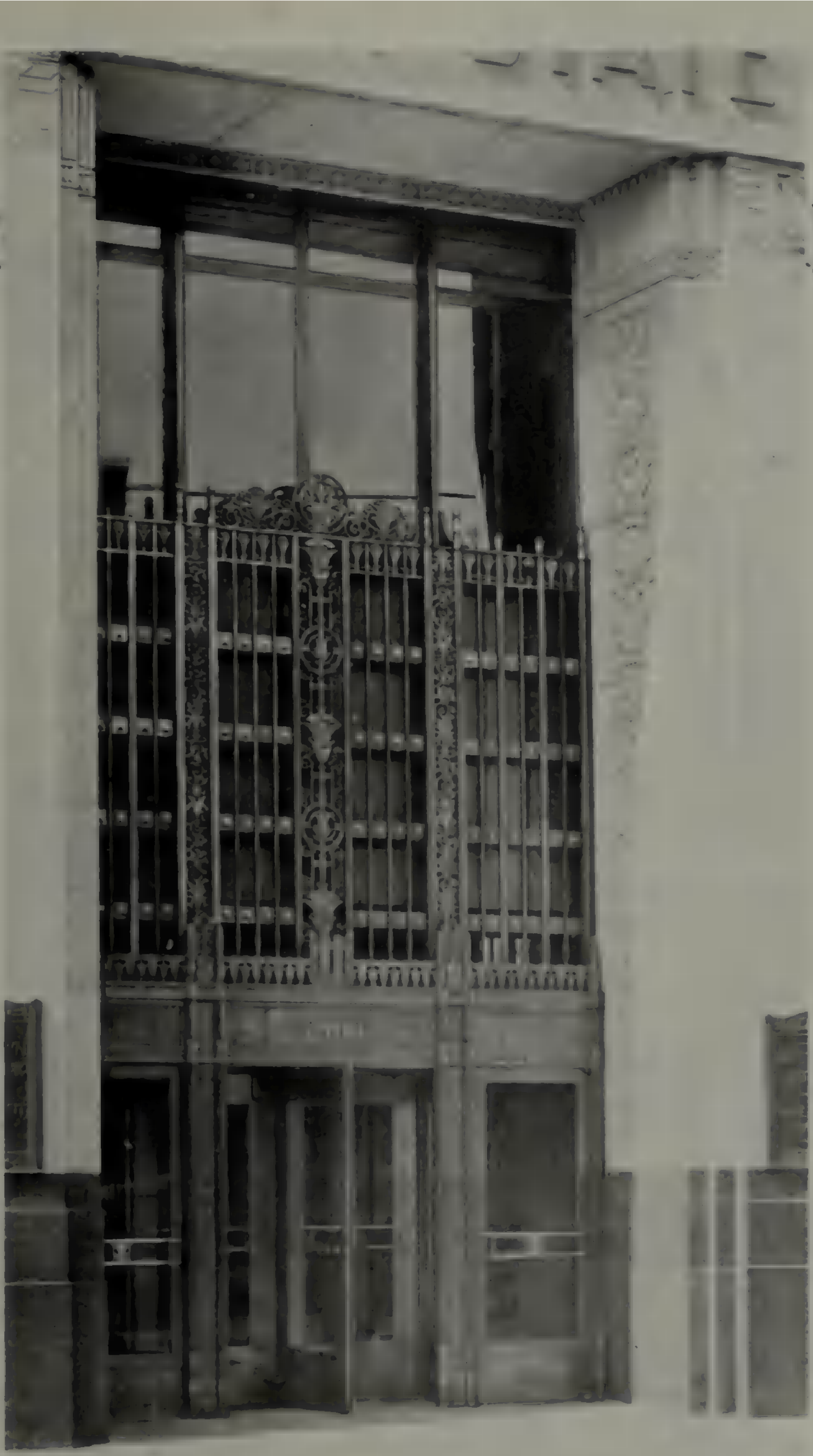
ORNA-METAL

Crafted by MICHAELS

FOR WEST TOWN STATE BANK, CHICAGO

WHERE metals and ideals are affinities . . . melted in the same flaming pot . . . poured in the same mold are ideas and ideals that make orna-metal work crafted by Michaels a supreme attainment. Many of the world's most prominent architects find the expression of their art in metal when crafted by Michaels.

For example, the above beautiful grille and header in the West Town State Bank, Chicago. Here is mute evidence of Michael's orna-metal,—different thru its perfect interpretation of the architect's ideal.



Doors, header and grille of Benedict Nickle in the West Town State Bank, Chicago. Designed by Architect Mundie & Jensen. McLennan Construction Company, Chicago, contractors. Crafted by Michaels Art Bronze Co., Covington, Ky.

Michael's welded doors, extruded window frames and store fronts are architectural and engineering achievements! To help you with these details we have prepared ready for blue-printing, complete sets of tracings. Write for your set in an angular tabbed A.I.A. folder.

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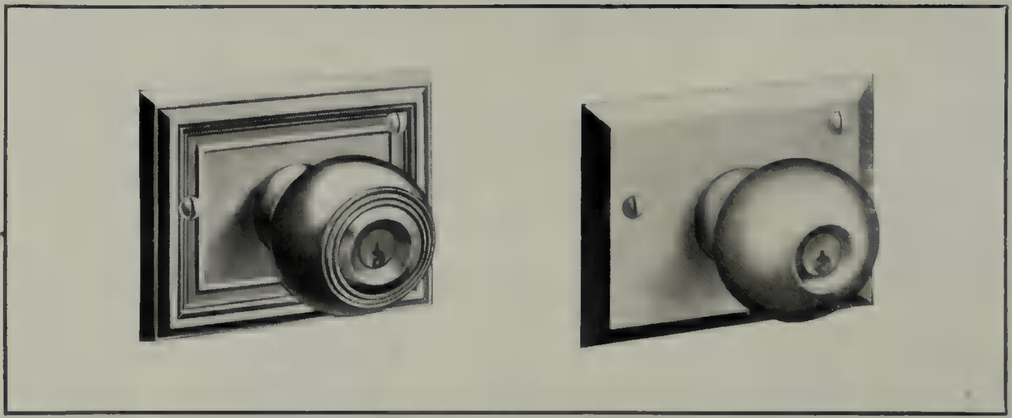
EXCELLENCE OF CONSTRUCTION DEMANDS THE BEST EQUIPMENT

Sargent Hardware adds to the beauty and service of this recently completed Cleveland Terminal Group, consisting of hotel, office building, and railroad terminal. Graham, Anderson, Probst & White, architects. The Sargent Union Locks shown indicate the up-to-date design and the high quality of the complete Sargent equipment.



SARGENT

LOCKS AND HARDWARE

SARGENT HARDWARE contributes to the beauty and usefulness of each one of the buildings that make up the great Cleveland Terminal Group — office building, hotel, and railroad terminal. So also Sargent Hardware will add to the complete satisfaction of your own home. This fine quality hardware is a usual specification when excellence of equipment must finish off excellence of construction.

Sargent Hardware covers the entire field of building — hotel, apartment, hospital, public and educational buildings and residences of every size. Designs range from classic, authentic reproductions of the various period patterns to the extreme simplicity of the ultra-modern.

Sargent Hardware, of solid brass or bronze, is extremely durable. Of the finest materials and the most precise workmanship, the operation of each item is lastingly easy and smooth. Now, as for generations, the name SARGENT, on any hardware item, stands for finest quality merchandise. Sargent & Company, New Haven, Connecticut. In New York City — Builders' Hardware Division and Showroom, 295 Madison Avenue; Warehouse, 94 Centre Street. In Chicago—150 North Wacker Drive (at Randolph).

GREATLY HIGHER VALUE FOR GREATER LESS COST

After all, Roddis Flush Doors when finished cost less than ordinary doors made ready for hanging. Roddis Doors when stained, filled and shellacked at our factory before shipping are protected and preserved in transit against moisture, warping, raising grain, etc. The doors arrive at the job ready to hang, with only the final coat of finish to apply. The sanding and finishing expense is saved; and in addition a far superior door is obtained because of Roddis completely solid construction and permanently enduring beauty and finish. Therefore, where Roddis quoted price might be a little higher, the greatly higher value and economy represented make Roddis price actually lowest.

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Horace Trumbauer . . . . . *Architect*

And a View of the Roddis Flush Doors Installed . . . .

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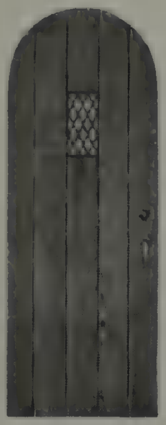
— for residences especially

Before you next decide upon doors write for and read the interesting Roddis Catalog: of exceptionally attractive stock doors, for apartment buildings and residences particularly. Where you require a special inlay or figure design to particularly lend with the interior trim, Roddis Department of Design is at your service: to originate or to follow idea furnished. Roddis Flush Doors, of standard styles or custom made special designs are universally preferred: for most enduring service and beauty and real economy value. Write Roddis now.



Ph. Lindsley Small, Cleveland, Ohio . . Architect

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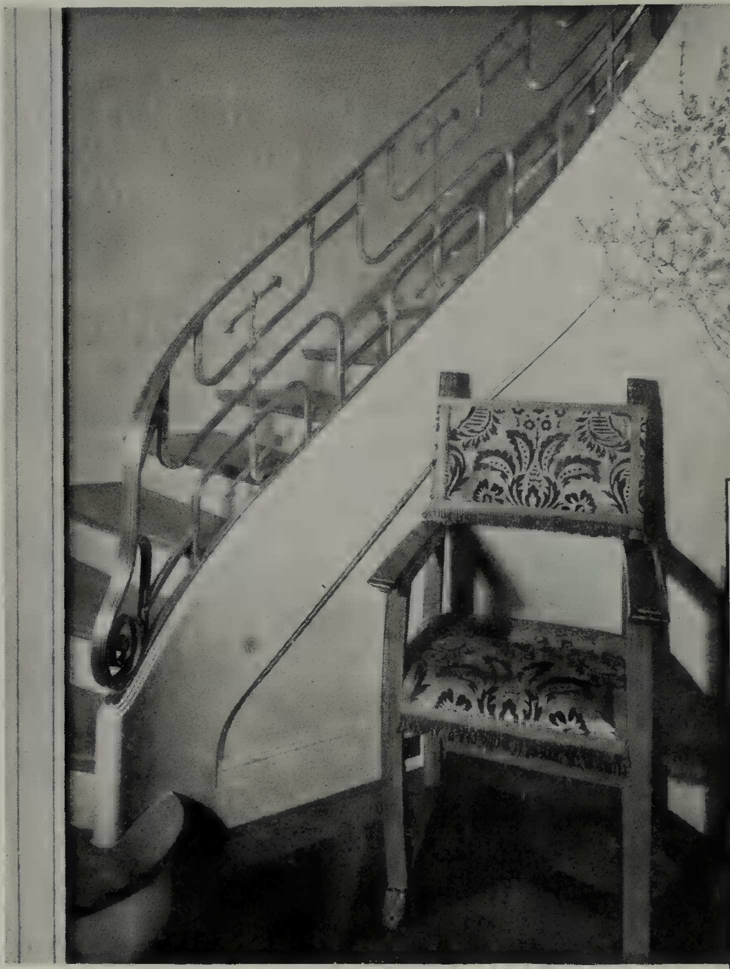
PERMANENT AS ONLY NICKEL ALLOYS CAN BE



(At left) *Stair rail of forged Monel Metal manufactured for a New York residence by RENNER & MARAS, INC., Long Island City, N. Y. HARRY ALLEN JACOBS, Architect.* (Below) *Forged Monel Metal door installed in same residence.*

Enduring Monel Metal...

for distinctive effects in modern design

For modern metal work Monel Metal enables the architect or designer to achieve original effects with enduring charm and distinction.

The stair railing illustrated is typical of the many unusual treatments available with Monel Metal. In this case, it is noteworthy that the design is structural and not achieved through applied ornamentation.

Monel Metal is just as well-suited to outside as to interior metal work, because it is immune to rust and resistant to the attacks of corrosion. It can be kept clean with minimum cleaning effort. It has no coating to chip or wear off, for it is solid throughout—like sterling. Its rich, silvery beauty will endure indefinitely against the ravages of wear and weather.

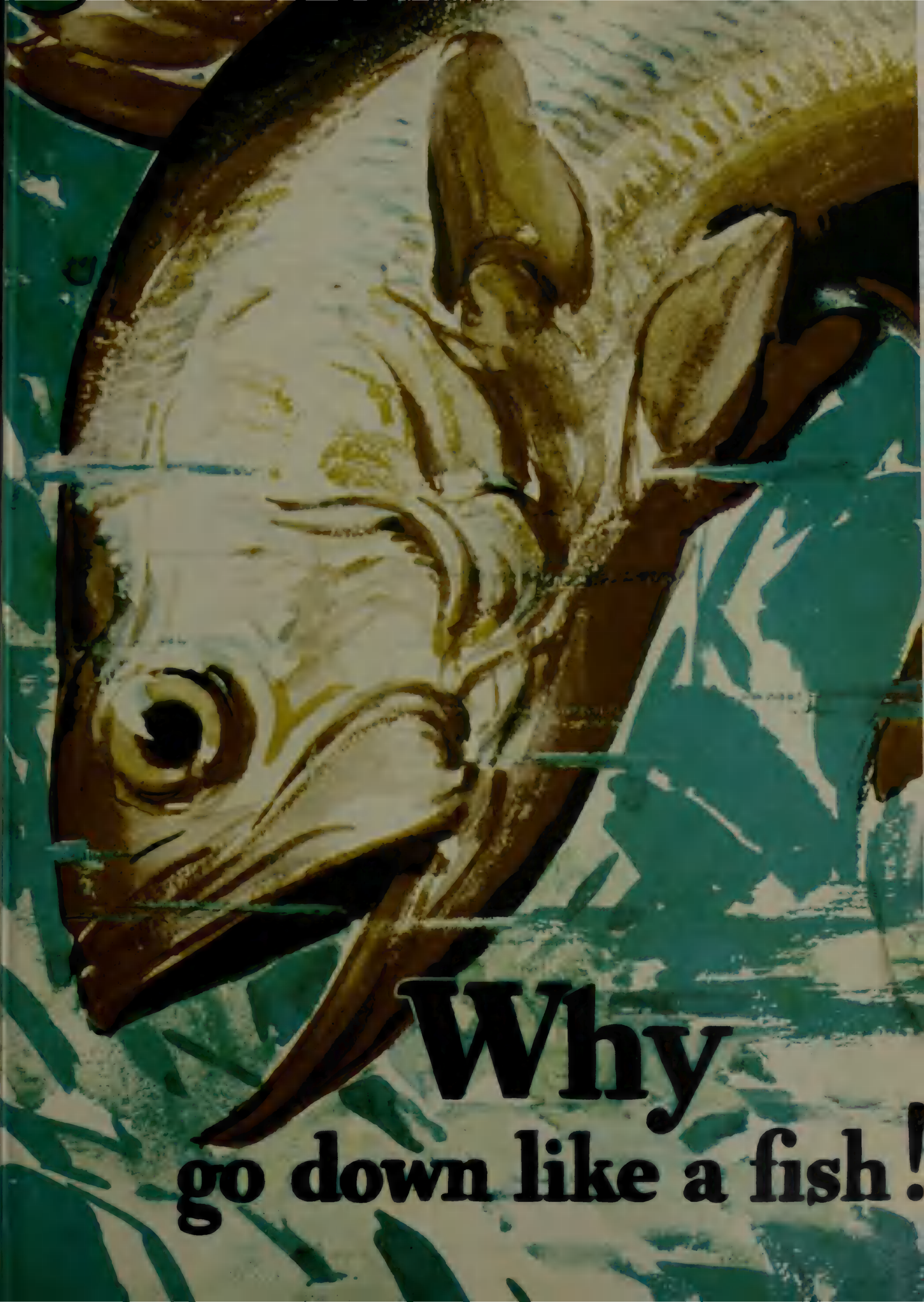
Monel Metal is available from stock in all standard shapes and forms and a wide range of finishes. Write for additional information on structural and ornamental uses of this modern material.

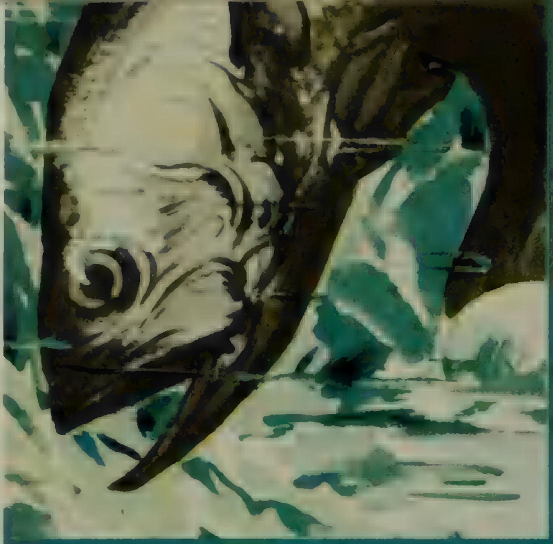
INCO MONEL METAL

MONEL METAL

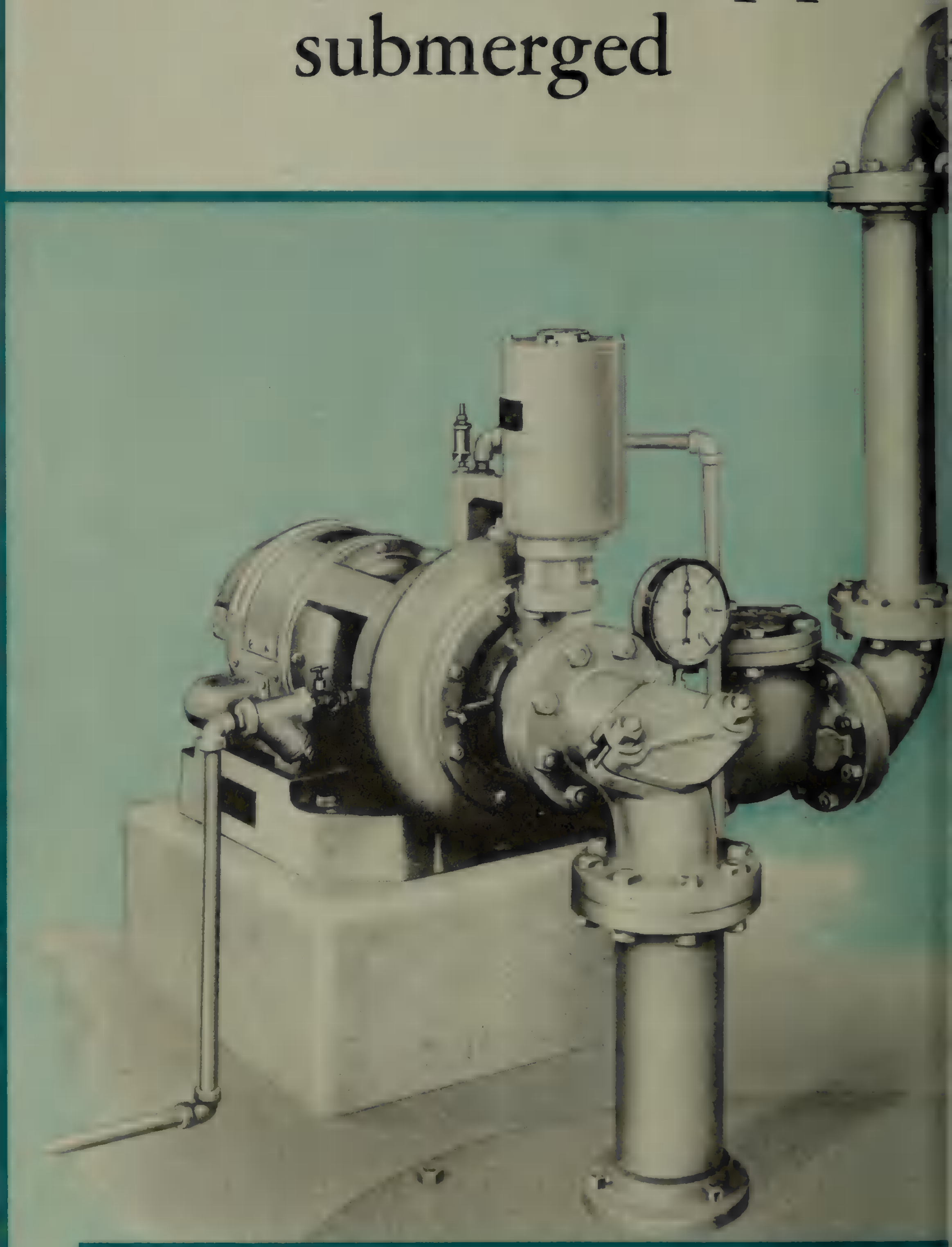
Monel Metal is a registered trade mark applied to a technically controlled nickel-copper alloy of high nickel content. Monel Metal is mined, smelted, refined, rolled and marketed solely by International Nickel.

THE INTERNATIONAL NICKEL COMPANY, INC., 67 WALL STREET, NEW YORK, N. Y.


Why
go down like a fish!



A Jennings Sewage Pump *has only the suction pipe* submerged



You can inspect or clean a Jennings *right out on the floor*

CONVENIENCE is the outstanding feature of a Jennings. There is nothing awkward about getting at this sewage pump. The entire assembly is installed on the floor, outside the pit. Nothing is submerged except the suction pipe.

With every working part so accessible, easy work is made of inspection and cleaning. Opening up the pump and even removing the impeller takes only a few minutes. Neither pit cover, piping nor shaft alignment need be disturbed.

Jennings Suction Sewage Pumps are furnished in capacities and heads to meet all the usual requirements. All sizes are equipped with non-clog impellers. No screens are required.

Write for Bulletins 113 and 124.

NASH ENGINEERING COMPANY
33 Wilson Road, South Norwalk, Conn.

Jennings
SUCTION
SEWAGE
Pumps

Note these 10 *features of Jennings Design*

1 Motor is commercial, ball-bearing type selected for dependability, always available from stock.

2 The only two moving parts are mounted on a single heavy shaft requiring but one stuffing box, eliminating flexible coupling.

3 A rugged supporting bracket, integral with motor end shield, makes pump and driving motor a single compact assembly in perfect alignment.

4 The non-clog impeller is accurately balanced, liberally proportioned, readily reached.

5 There are only two bearings to lubricate.

6 Suction elbow is fitted with hand hole plate to permit cleaning suction pipe and impeller without dismantling pump.

7 Priming unit is a simple, sturdy Nash Hytor.

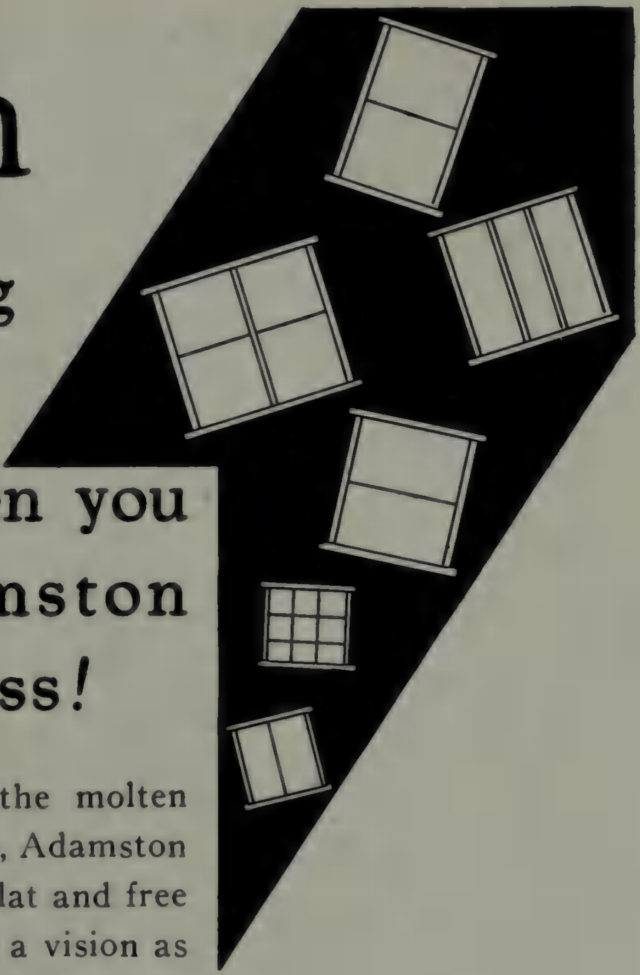
8 Iron catch basin has gas tight cover.

9 Controlling float switch is totally enclosed and oil immersed.

10 Ball float has adjustable stop.

Clear Vision

for the Eyes of your Building



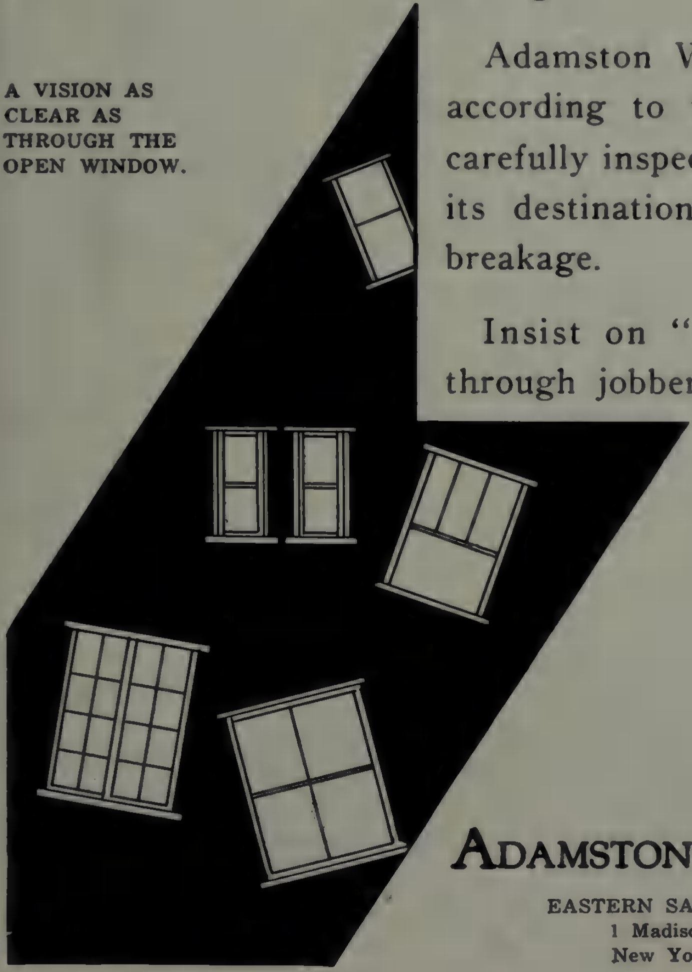
is assured when you specify Adamston Window Glass!

Vertically Drawn from the molten "Metal" to the finished state, Adamston Window Glass is perfectly flat and free from distortion—permitting a vision as clear as through the open window.

In addition to its clearness it has a beautiful lustre, either side may be glazed out, and it is of great tensile strength.

Adamston Window Glass is graded according to the highest standards, carefully inspected and packed to reach its destination with a minimum of breakage.

Insist on "Adamston"—obtainable through jobbers in all principal cities.



A VISION AS
CLEAR AS
THROUGH THE
OPEN WINDOW.

Winter Windows

Insulating homes against the dangerous drafts of winter with storm sash is an excellent investment, not only as a safe guard to the health of the family, but in the matter of fuel. Here again Adamston Window Glass may be specified with a feeling of security.

VERTICALLY [illegible] FLAT GLASS
ADAMSTON FLAT GLASS CO.
CLARKSBURG, W. VA.

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"The UNOFFICIAL PALACE"

"The unofficial palace of New York," as the old Waldorf-Astoria was called, is gone. On its site has been erected the 85-story Empire State Building, the world's highest structure.

A new and greater Waldorf-Astoria, on Park Avenue between 49th and 50th Streets, will open its doors in October, 1931. The superb architectural beauty of this veritable palace, and the rare distinction of its interior decorations will suitably continue a great tradition.

Carnegie Beams were used in the construction of both the Waldorf-Astoria and the Empire State Building.

FOR THE WALDORF-ASTORIA

Schultze & Weaver, *Architects*
H. G. Balcom, *Structural Engineer*
Thompson-Starrett Co., Inc.,
General Contractors
McClintic-Marshall Co.,
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US STEEL

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Subsidiary of United States Steel Corporation

103

Steel is Style

in Modern Kitchen Cabinetry

▼

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OLEAN Quality is making steel the style in modern kitchen cabinetry for homes, apartments and hospitals.

Through skillful design, an exclusive type of rigid construction, electro-welded, has made it possible to build Olean Cabinets and Cases with narrow stiles, cross rails and margins. This provides extra capacity and visibility.

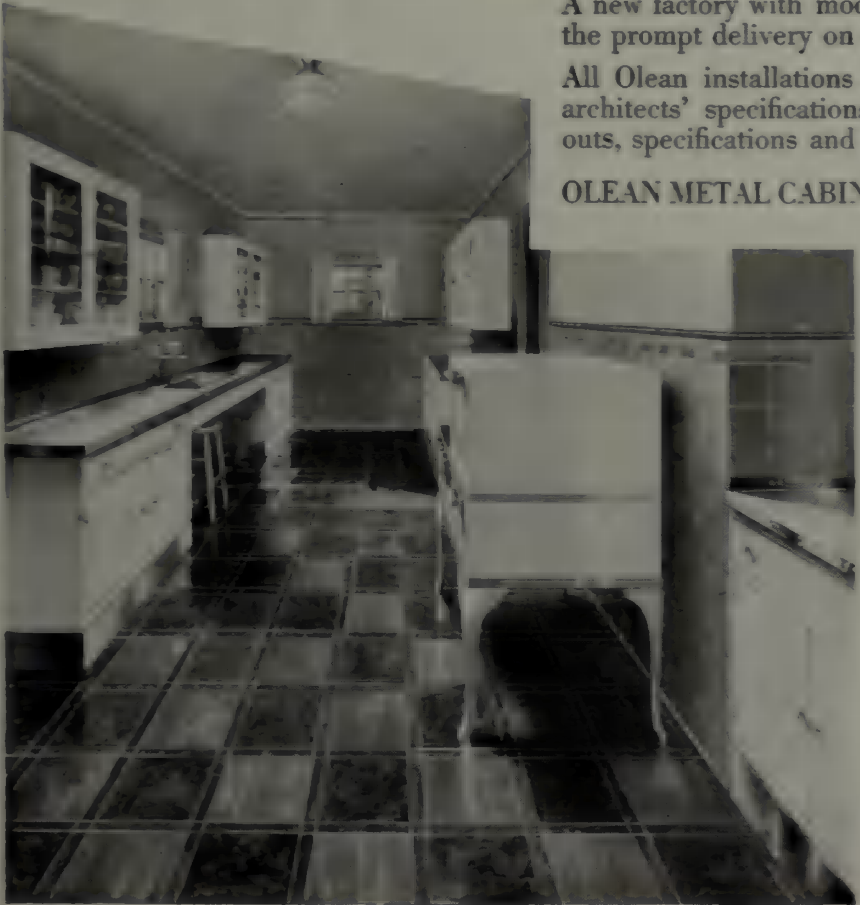
Strong, durable and distinctive hardware is used throughout—New semi-concealed hinges—Adjustable shelf supports—Non-sagging drawer channels with automatic stops—Special drawer locks—All exposed edges are carefully rounded—Counters can be furnished in Monel Metal—Steel covering—Laminated maple—or Linoleum.

Olean finishes which will not mar, chip or scratch are applied by scientific electric baking methods, and in any color to harmonize with any motif of interior decoration.

A new factory with modern and ample facilities assures the prompt delivery on all contracts no matter what size.

All Olean installations are guaranteed to comply with architects' specifications. Write today for detailed layouts, specifications and illustrations of Olean Cabinetry.

OLEAN METAL CABINET WORKS, INC., OLEAN, N.Y.



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Metal Cabinets

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Please send specifications and details of
Olean Cabinets of Steel.

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STUDIES IN TECHNICAL CO-OPERATION

STRIKING A MODERN NOTE IN LIGHTING

with wiring adapted to restaurant needs

by FREDERICK PUTNAM PLATT—A. I. A.
of F. P. Platt & Bro., Architects, New York, N. Y.

In the Horn & Hardart Company restaurant at 1165 Sixth Avenue, New York, light enhances the inviting atmosphere of the restaurant and provides appetizing display for food.

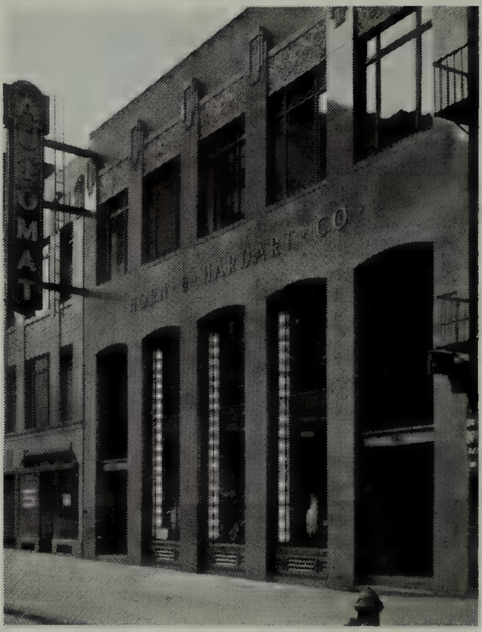
Uncontrollable factors necessitated the development of an unusual type of exterior illumination for this building and the decorative scheme of the interior called for a lighting plan that would take full advantage of the colors and materials used.

In such a situation, where specific questions of lighting practice are raised, proper co-operation between the architect and the lighting and wiring section of the local electric service company can be most valuable. Information about changing styles in lighting and about the use of light for both decorative and merchandising purposes helps materially in reaching a happy solution of the problems.

For the exterior illumination in this case, lighted panels are used at the sides of the window jambs. These give a pleasing effect, both day and night, while they also bathe the interior with a soft glow of light which enriches the decorative features.

Modernistic ceiling and side wall fixtures make the restaurant interior inviting. A continuous hood-light over the cafeteria and automat counters is used in the merchandising of food.

The total connected load in this restaurant is 63 K.W. for lighting and 50 H. P. for power. Every care has been taken in the wiring to provide for possible future needs of the kind that are constantly developing through the increasing use of electricity.



Passers-by are attracted by the unusual exterior illumination—lighted panels installed at the sides of the window jambs.

Attractive pendant type fixtures provide general illumination over the mezzanine well.

Hood light illumination is used over the counters with a concealed lamp in each food compartment.

In the smaller bays a modernistic, box-type carved glass fixture is used.

For information about trends in lighting standards, and about adequate wiring, call on the Wiring Bureau of your local electric service company, or write direct.

NATIONAL ELECTRIC LIGHT ASSOCIATION, 420 LEXINGTON AVENUE, NEW YORK, N. Y.

Rolscreens

TRADE MARK

Greetings

DECEMBER ends the year and with it comes the greatest inventory of all—that of counting our friends.

Friendships in business often pass without expressions of appreciation. The enthusiastic endorsement and support given Rolscreens by architects during the past year have been vital factors in making the volume of Rolscreen sales far greater than had been anticipated.

To you, the architect who reads this page, is sent the season's greetings and a sincere "Thank you" for your cooperative spirit which the Rolscreen Company has enjoyed in 1930.

Rolscreen Company
450 Main Street
Pella :: :: :: Iowa

FLATTER, BRIGHTER, CLEARER —YET *NOT* HIGHER PRICED

FLATTER—freer from waves and streaks and surface imperfections than window glass ever was before. Brighter—the finest, most even surface a fire-finished glass ever showed. And both sides alike—saving labor for the glazier. Yet the price—the same as that of ordinary glass! Unquestionably a vitally important development in glassmaking.

Let Pennvernon speak for itself. Any Pittsburgh Plate Glass Company warehouse—they're located in all leading cities—will gladly supply samples and fill orders promptly. And read the new booklet about the revolutionizing process by which Pennvernon is made. Just write to Pittsburgh Plate Glass Company, Grant Building, Pittsburgh, Pa.

PENNVERNON
flat drawn
WINDOW GLASS

IN THIS PITTSBURGH HOSPITAL

Allegheny General Hospital
Pittsburgh, Pa.

York & Sawyer,
Architects

Geo. H. Soffel Company,
Plumbing Contractor

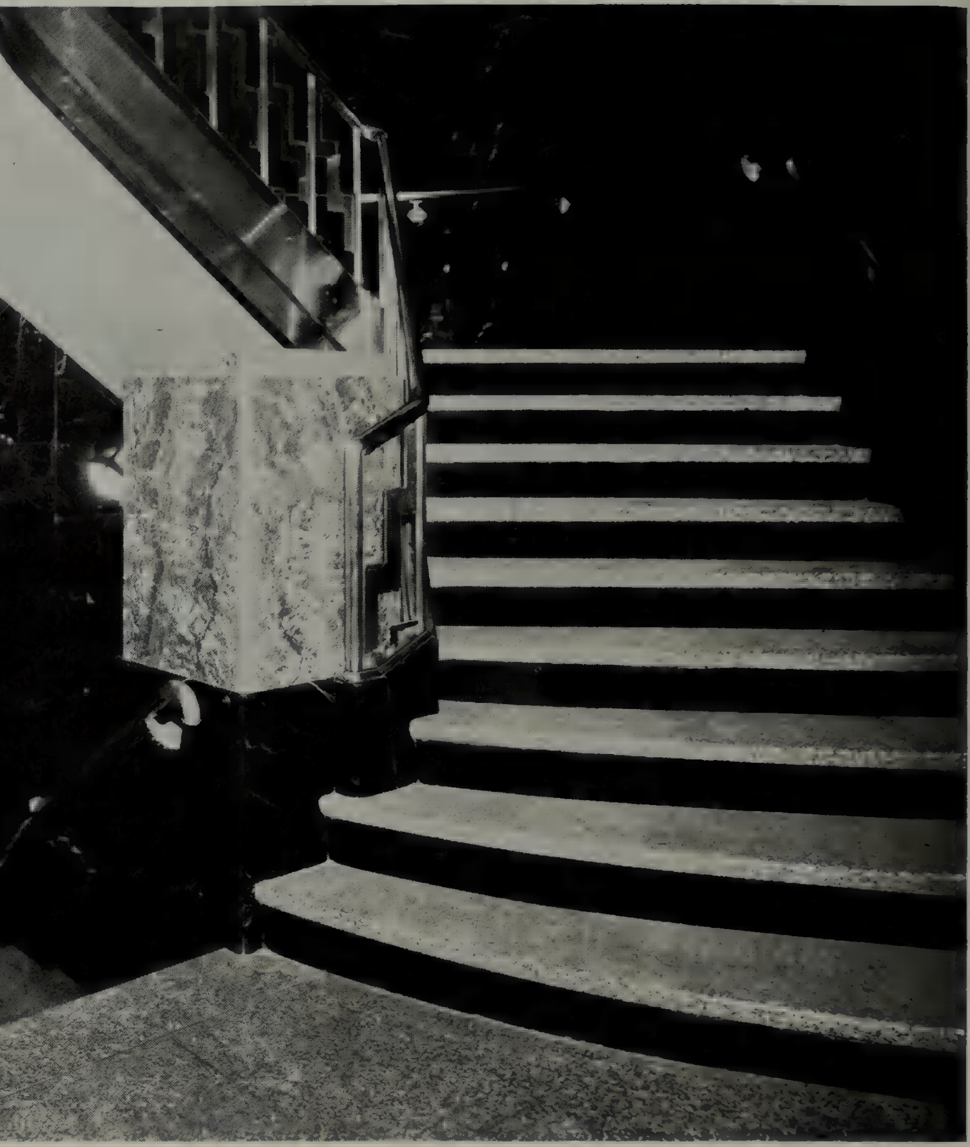
See Sweets
(14 Pages)

York & Sawyer, New York architects, fully realize the value of assured sanitation and freedom from servicing troubles in the drinking water fixtures they select. So, in specifying the drinking fountains for this beautiful, modernly appointed hospital, Halsey Taylor was the choice! The Halsey W. Taylor Co., Warren, Ohio.

HALSEY TAYLOR *Drinking Fountains*

THE SPECIFICATION FOR SANITATION

This is No. 631, the type specified for the above building, with automatic stream control (uniform height of drinking stream regardless of pressure changes) and patented two-stream projector (illustrated) which makes it impractical for lips to touch source of supply.



Modernistic Design for Beauty Modern Materials for Safety

THIS stairway is typical of the new Chrysler Building—thoroughly modern in design from the viewpoints of both safety and beauty. Alundum Aggregate Treads assure permanently non-slip walking surfaces on the main stairways that lead from the street floor to the next floors above and below.

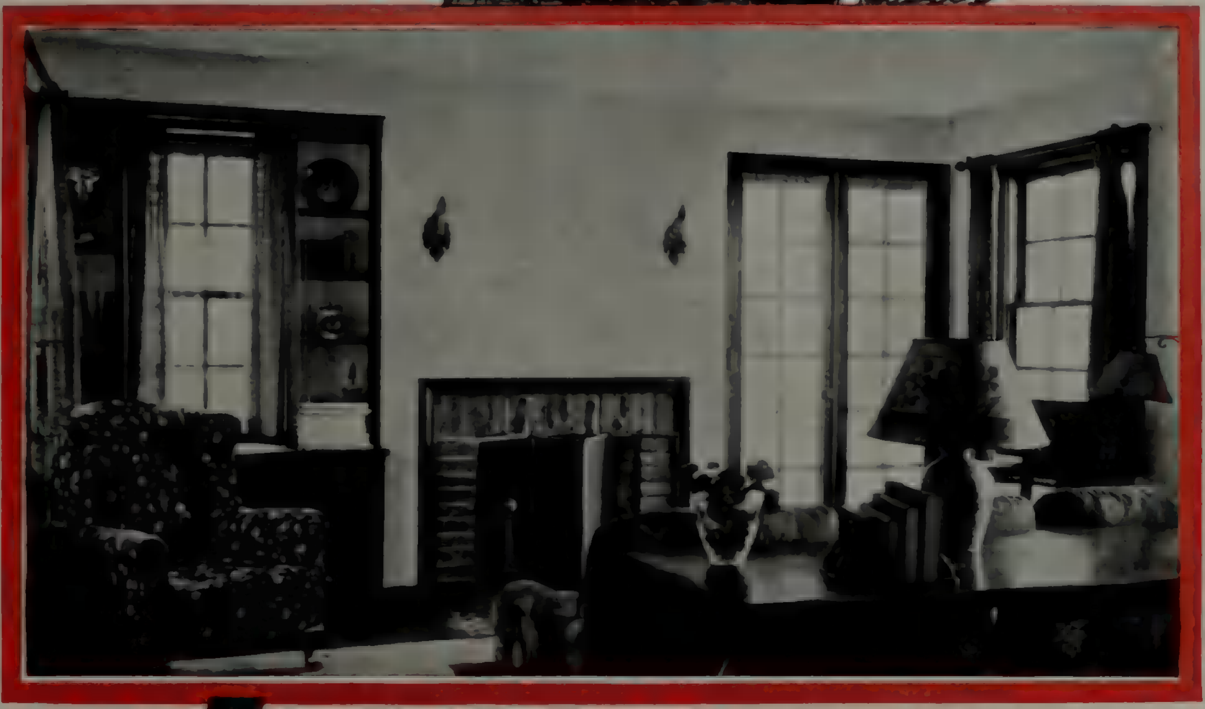
Another form of Norton Floors—Alundum Terrazzo—has been used under the revolving doors of the entrances, for elevator mats and corridor ramps.

NORTON COMPANY, WORCESTER, MASS.

NORTON FLOORS
Alundum Tiles Treads & Aggregates

T-276

"Spreads like warm butter"



TIGER—for Distinctive Interiors

Another Tiger Job

LIVING ROOM—Home of
H. A. G. Scherer, Summit, N. J.

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Plastering Contractors
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Tiger Finish used exclusively

The artistic textures and finishes that mark the trail of our symbolized Tiger graphically individualize the walls and ceilings of America's finer structures. , , *More,* they proclaim in a most forceful way a uniform quality construction throughout.

You can be assured of securing this *Famous* Finishing Lime by specifying the bag trade-marked with the Tiger.

The KELLEY ISLAND LIME & TRANSPORT COMPANY
World's Largest Producer of Lime
LEADER BUILDING ∴ ∴ CLEVELAND, OHIO

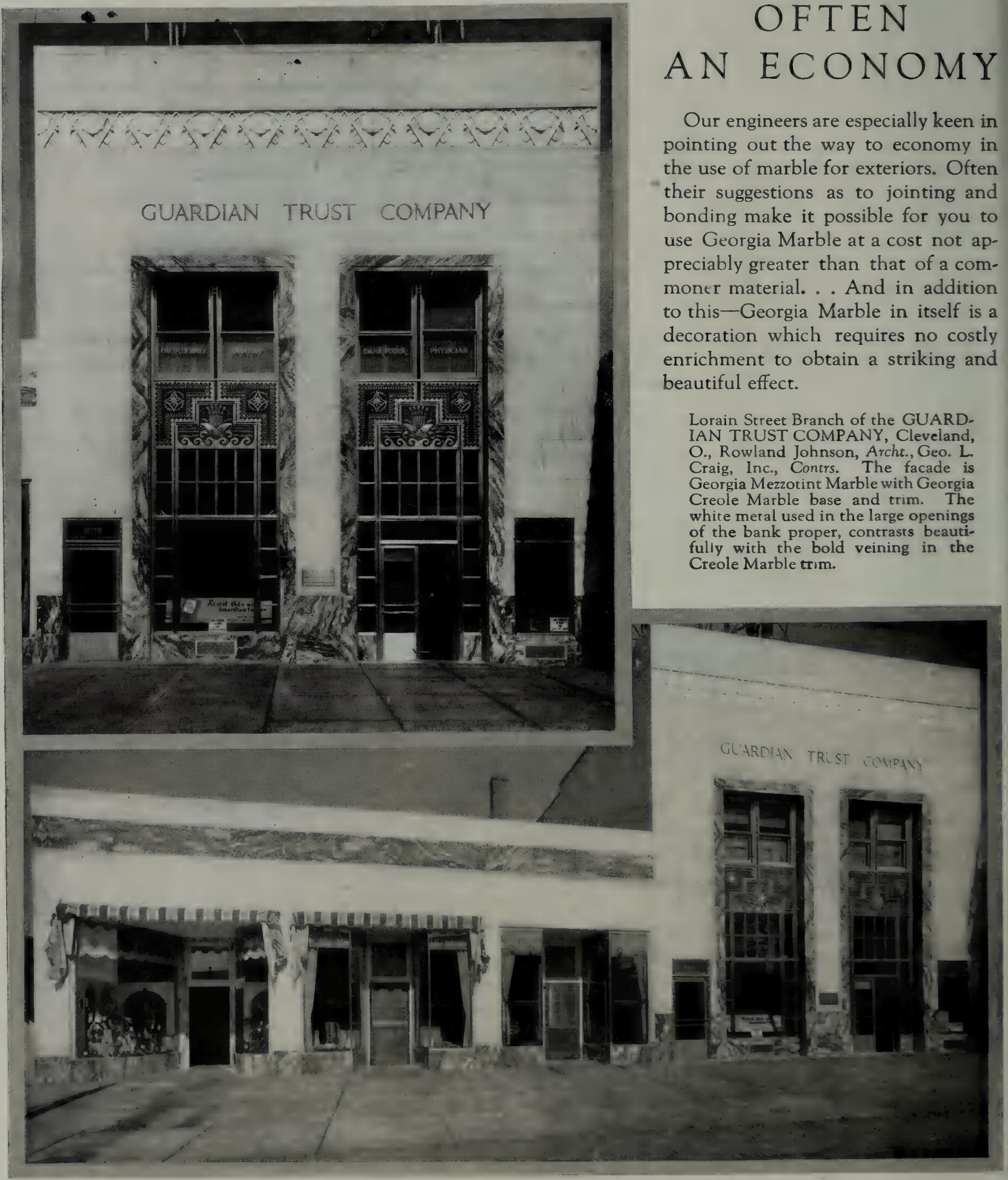
The Famous TIGER FINISH

And—Tiger Mason's, Tiger Agricultural, Tiger Chemical, Tiger All-Purpose Hydrate in 10-lb. packages, and High Calcium and Magnesium Lump Limes. Also Quickslake (ground quicklime) in paper-lined jute sacks.

GEORGIA MARBLE

OFTEN AN ECONOMY

Our engineers are especially keen in pointing out the way to economy in the use of marble for exteriors. Often their suggestions as to jointing and bonding make it possible for you to use Georgia Marble at a cost not appreciably greater than that of a commoner material. . . And in addition to this—Georgia Marble in itself is a decoration which requires no costly enrichment to obtain a striking and beautiful effect.



Lorain Street Branch of the GUARDIAN TRUST COMPANY, Cleveland, O., Rowland Johnson, *Archt.*, Geo. L. Craig, Inc., *Contrs.* The facade is Georgia Mezzotint Marble with Georgia Creole Marble base and trim. The white metal used in the large openings of the bank proper, contrasts beautifully with the bold veining in the Creole Marble trim.

THE GEORGIA MARBLE COMPANY · TATE · GEORGIA

1328 Broadway NEW YORK	*814 Bona Allen Bldg.* ATLANTA	*648 Builders' Bldg.* CHICAGO	*622 Construction Industries Bldg.* DALLAS	*1200 Keith Bldg.* CLEVELAND

Viscosity cup

For paints and other pigmented products. Paint is allowed to flow through a small opening in the bottom of a brass cylinder—4 inches high and 1½ inches in diameter. The time it takes for 50 cubic centimeters of paint to flow out is a measure of the viscosity.

PAINT VS. SECONDS

"NOT too thick—not too thin." That's the general rule the painter follows if the paint is to brush easily . . . flow together to eliminate brush marks . . . and give a film that dries to a hard, impervious surface of the desired sheen.

But the guesswork can't determine the exact viscosity. So du Pont chemists use the scientifically accurate method which times the flow of a known quantity of paint to a second.

Guesswork and rule-of-thumb methods in evolving formulas or checking production against standards are banished from du Pont Laboratories. Knowing the results desired from a paint, du Pont chemists delve into the life history of every raw material . . . try and test every possible combination of ingredients . . . finally arrive at the desired formula after actual tests of the finished product . . . and then work back from the product to check every characteristic against an adopted standard.

This is *Pre-testing*. And Pre-testing is the motto on the wall of every du Pont Laboratory. It enables you to say, "I can trust du Pont products." It is the house owner's assurance of protection and lasting beauty.

When you come to your next paint specification, remember—"du Pont finishing products are Pre-tested."

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We invite your inquiry about du Pont paints, varnishes, enamels, Duco, and other finishing products. Our architectural division is equipped to deal intelligently and quickly with special problems regarding application, decorative effects and technique.

Write to Dept. A R 12, E. I. du Pont de Nemours & Co., Inc., at any of these addresses: Public Ledger Building, Philadelphia; 2100 Elston Avenue, Chicago; Everett Station No. 49, Boston; 1 Balfour Bldg., 351 California Street, San Francisco.

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VARNISHES **DUCO**

ENAMELS **PAINTS**

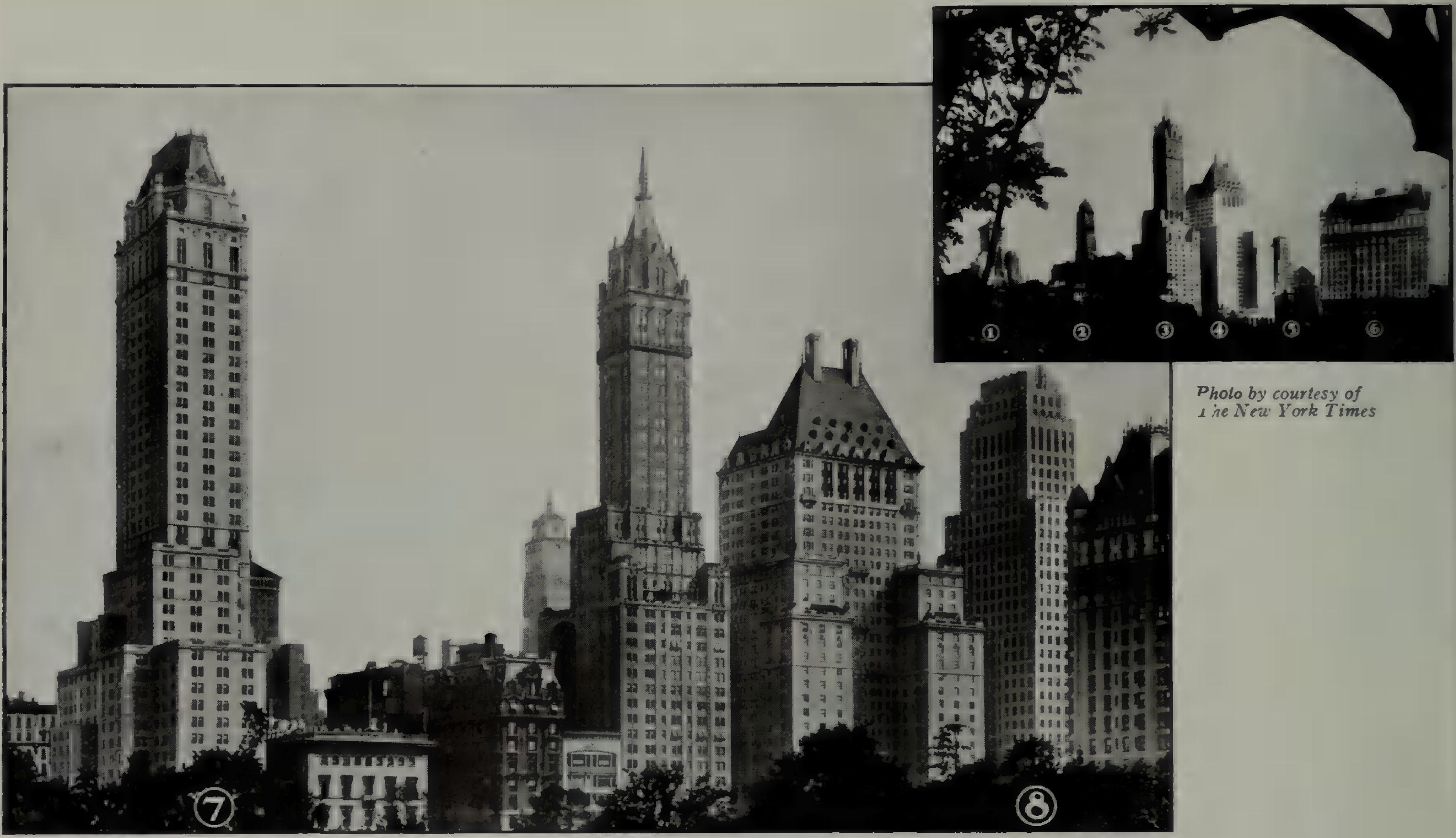

Photo by courtesy of The New York Times

Photo by courtesy of The New York Sun

A Change–
Not a Correction!
Another "Random Shot"

"BRYANT EQUIPPED" BUILDINGS in the PLAZA ZONE

1. *Delmonico Building. Architects: Goldner & Goldner. Electrical Contractor: J. L. Goodrich*
2. *Ritz Tower Architect: Emory Roth. Electrical Contractors: J. Livingston & Co.*
3. *Sherry Netherlands Hotel. Architects & Engineers: Schultze & Weaver. Electrical Contractors: J. Livingston & Co.*
4. *Savoy Plaza Hotel. Architects: McKim, Mead & White. Electrical Engineers: Tenney & Ohmes. Electrical Contractors: Walter H. Taverner Corporation.*
5. *Brisbane Building. Architect: Emory Roth. Electrical Contractors: P. J. Keogan Co., Inc.*
6. *Plaza Hotel. Architects: Warren & Wetmore. Electrical Contractors: Walter H. Taverner Corporation.*
7. *Hotel Pierre. Architects & Engineers: Schultze & Weaver. Electrical Contractors: Greer Electric Construction Co.*
8. *Squibb Building. Architect: Ely Jacques Kahn. Electrical Contractors: Alliance Electric Company, Inc.*

SOME months ago, we ran an advertisement featuring a photograph, again reproduced in inset, which appeared in the New York Times. All six of the buildings included in this were "Bryant Equipped". Several weeks ago, there appeared in the New York Sun another photograph of the "Plaza Zone", taken from almost the same spot. This is reproduced above. Note the two additions to the skyline—The Hotel Pierre and The Squibb Building. These, too, are "Bryant Equipped". While the New York skyline is constantly changing, those architects and engineers who insist upon the best continue to specify Bryant "Superior Wiring Devices" and contractors who carry out their plans are only too glad to use them, for Bryant Devices, since 1888, have been a standard throughout the world.

A-12

THE BRYANT ELECTRIC COMPANY

BRIDGEPORT **CONNECTICUT, U.S.A.**

BRYANT SUPERIOR WIRING DEVICES

BOSTON · CHICAGO · NEW YORK · PHILADELPHIA · SAN FRANCISCO

50 High Street · 844 West Adams Street · 60 East 42nd Street · 1333 Chestnut Street · 149 New Montgomery Street

MANUFACTURERS OF "SUPERIOR WIRING DEVICES" SINCE 1888-MANUFACTURERS OF HEMCO PRODUCTS

Artistic . . . .

SLATE-FOR-THE-ROOF

. . . Custom-made

SAM SALVAGE RESIDENCE, GLEN HEAD, L. I., ROGER BULLARD, ARCHITECT

SIMPLICITY, - AND - QUIET - DIGNITY - OF - A - SLATE - ROOF - ARE ATTRIBUTES - OF - GOOD - TASTE - THE - UNFADING - TONES - OF - SOFT GREEN - AND - MELLOW - BLENDINGS - OF - MOTTLED - GREEN - AND PURPLE - WHICH - NATURE - HAS - SO - BOUNTEOUSLY - BESTOWED - ON MATERIALS - OF - HER - OWN - PRODUCTION;- ARE - HAND - WROUGHT BY - CRAFTSMEN - FROM - THE - ROCK - INTO - SHAPES - OF - VARIOUS THICKNESSES - AND - THEN - SKILLFUL - DESIGNERS - ACCOMPLISH - THE DESIRED - EFFECTS -

- BY -

O'BRIEN - BROS - SLATE - CO - INC

EST. 1901

QUARRIES
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DESIGN - AND - SERVICE
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101 PARK AVE N. Y. C.
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GRANVILLE,
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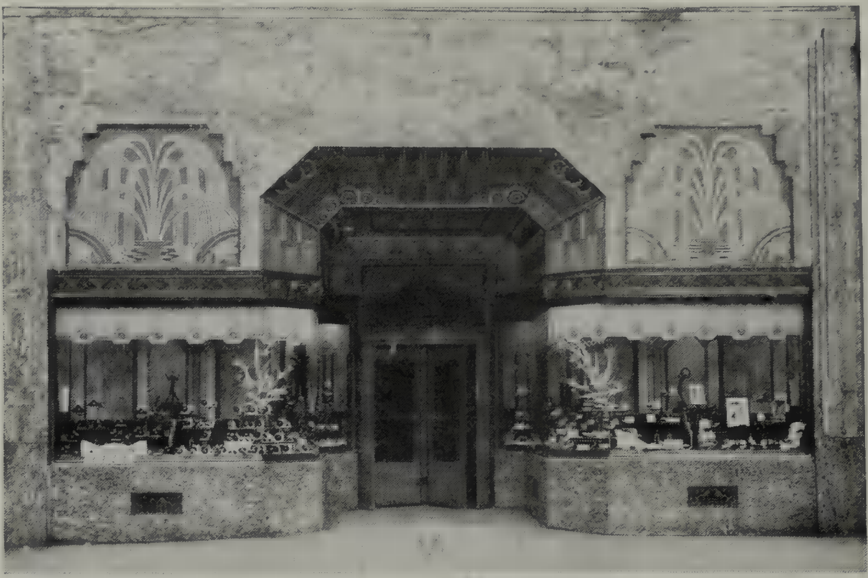
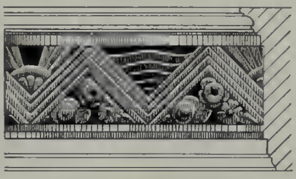
STORE FRONTS

by ZOURI



FRIEDBERG'S JEWELRY STORE DETROIT, MICHIGAN

in



TRANSOM BAR SECTION

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COLD ROLLED COPPER, BRONZE & ALUMINUM, CAST AND EXTRUDED BRONZE

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INTERNATIONAL [MODERN BRONZE STORE FRONT COMPANY
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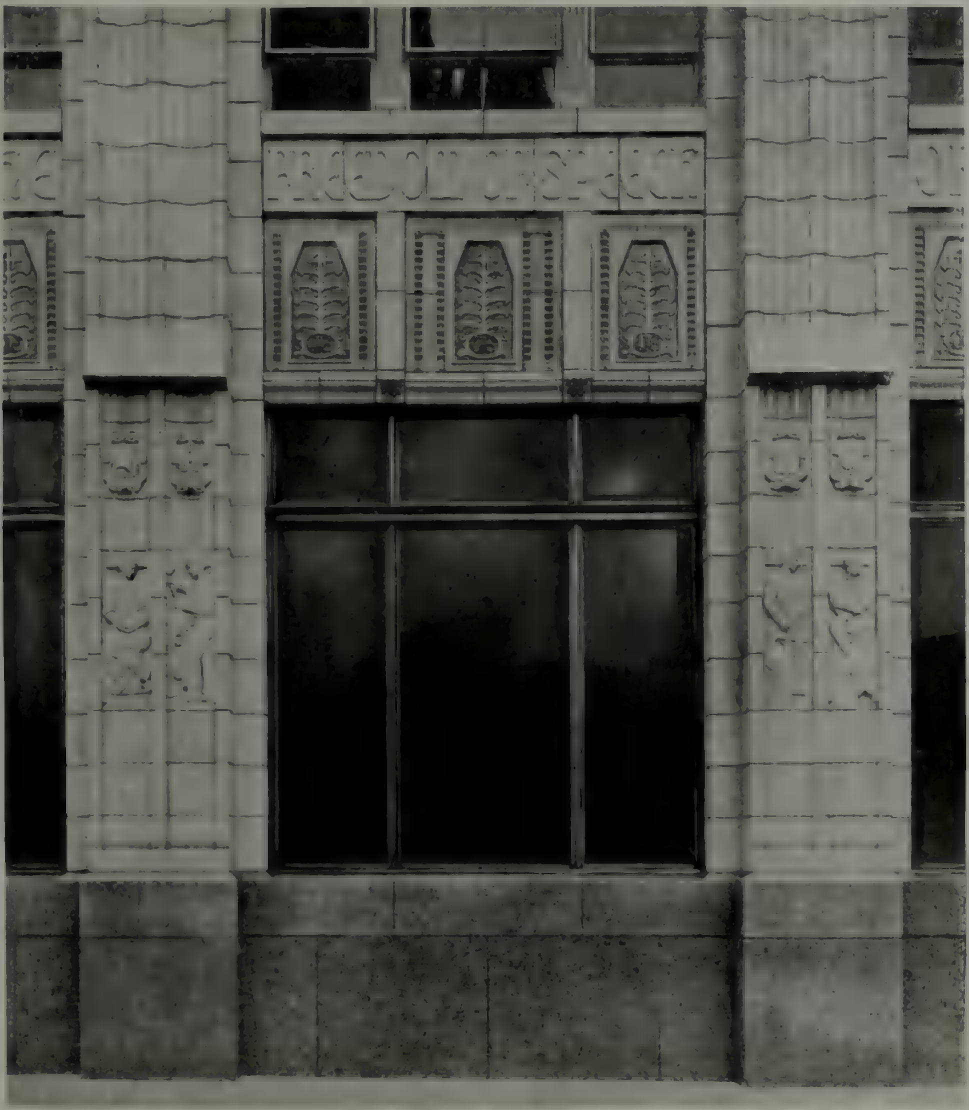
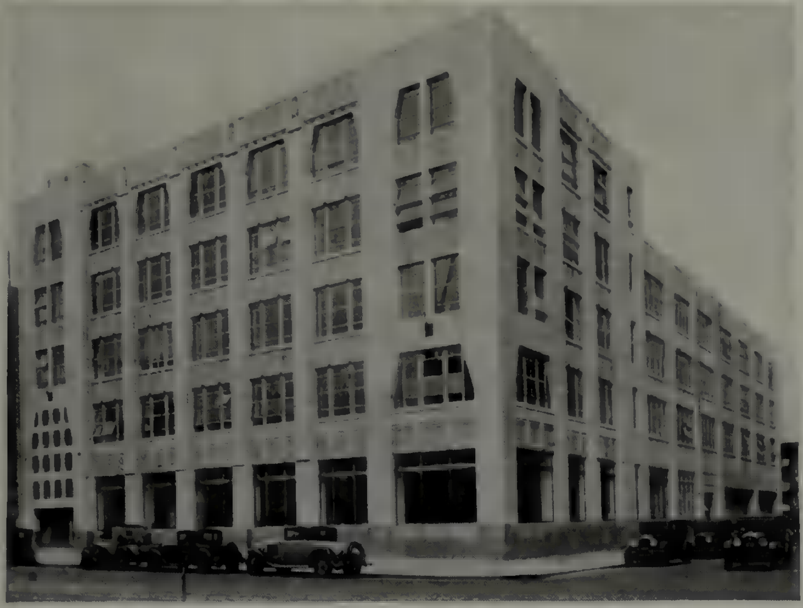
WRITE FOR CATALOG

FEDERAL SEABOARD TERRA COTTA



New building for the Buffalo Courier, Buffalo, N. Y.
Monks & Johnson, *Architects.*
John W. Cowper Company *Contractors.*



AN example, in modern design, of how, in color, form and cost Federal Seaboard Terra Cotta meets all requirements . . . The general color is buff multichrome texture. Spandrels are of polychrome in golden yellow and green . . . Attention is directed to the large bas-reliefs at the entrance and in the parapet; all made in one piece.

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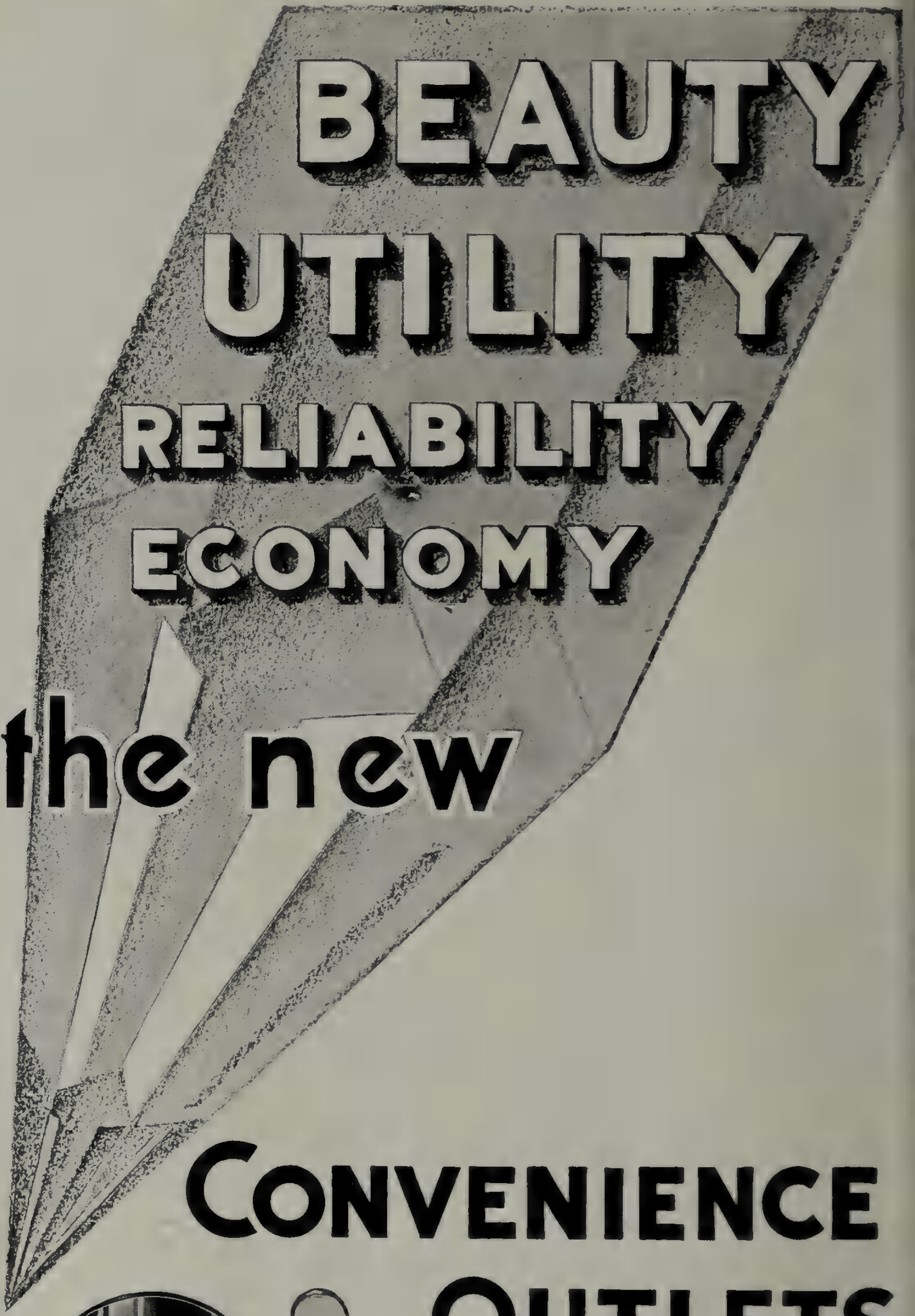


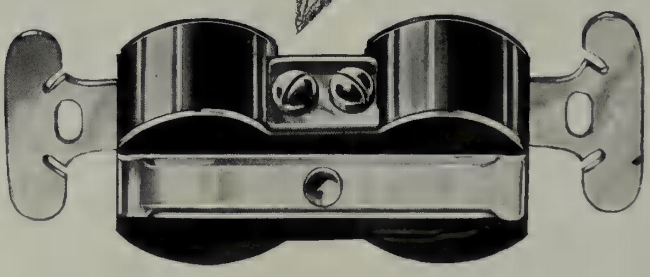
BEAUTY
UTILITY
RELIABILITY
ECONOMY

point to the new

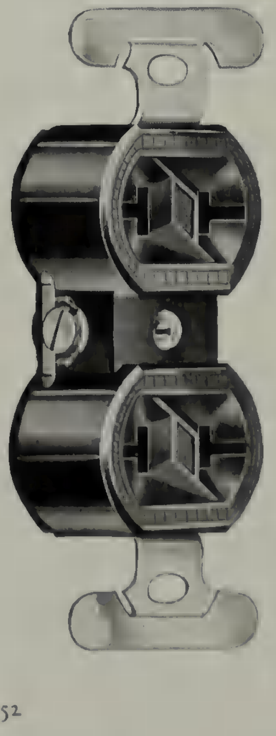
H & H

BAKELITE CONVENIENCE OUTLETS

No. 1913-G



No. 1912-G



COMPLETELY BAKELITE—face, body and back. Highly lustrous, black or brown, with polished appearance pleasing to prospects. Finding Ridges, modernist design, really *find* the slots for the plug prongs when pressed against face of Receptacle. Neatly in harmony with brass plates; a perfect match with your molded "HEGEMITE" plates.

With plaster ears, one binding screw each side, No. 1912-G. Two binding screws each side, No. 1913-G. Without plaster ears, same numbers without the "G". Write for H & H complete Wiring Device Catalogue.

6 Points *to Better the Wiring Job*

(1) BAKELITE back; moisture-proof.

(2) Reinforced yoke resists pressure; assures accurate alignment.

(3) One-piece contacts make positive electrical connections.

(4) Finding Ridge twists the plug-prongs "home".

(5) High-lustre, polished appearance pleases owners.

(6) 2 large-head No. 8 binding screws (each side, if specified) make wiring easier.

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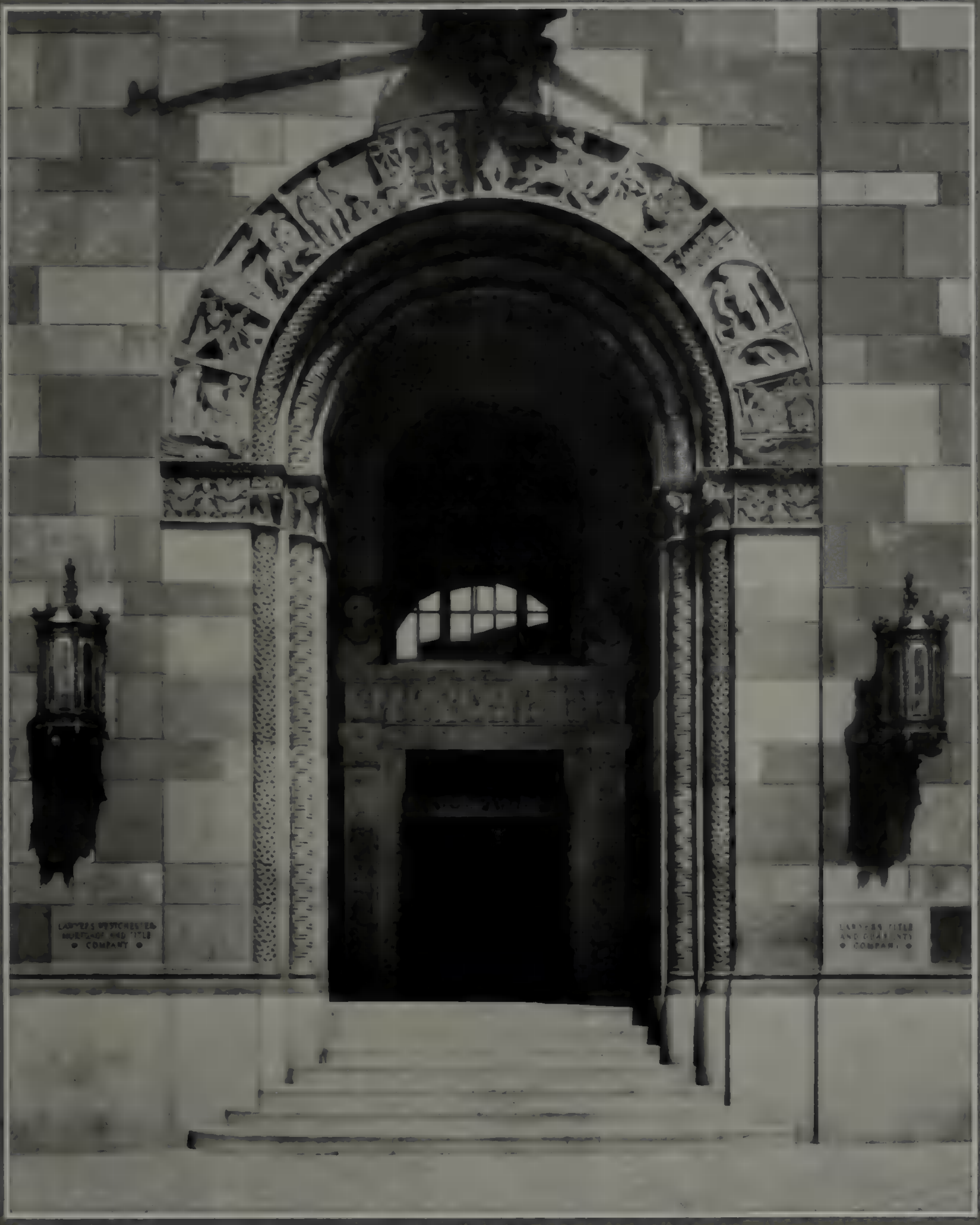
THE ARROW-HART & HEGEMAN ELECTRIC CO.
HARTFORD, CONN. MAKERS OF ELECTRIC SWITCHES SINCE 1890



CAST STONE IN COLORS RANGING FROM LIGHT BUFF TO DARK BROWN WAS USED IN THE LAWYERS TITLE AND GUARANTY COMPANY BUILDING, WHITE PLAINS, N. Y. ANDREW J. THOMAS, ARCHITECT. CLOSE CONTROL OF COLOR IS AN ADVANTAGE OF CAST STONE WHICH IS RAPIDLY EXTENDING THE USEFULNESS OF THIS MATERIAL.

THE CAST STONE INSTITUTE

33 WEST GRAND AVENUE.
CHICAGO, ILLINOIS.

The Whole World wants LUSTRAGLASS

FLAT-DRAWN

BECAUSE . . . .

It Transmits *ultra-violet* sun rays.

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It Transmits more *daylight*.

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It is the *"whitest"* of all glass made for windows.

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It *costs no more* than ordinary window glass.

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Never before has a window glass created such world-wide interest. Never before has a glass for glazing purposes offered so many advantages at *any price*. It is only natural that architects, builders and home buyers will not be satisfied with anything less than LUSTRAGLASS. Write for our LUSTRAGLASS BOOKLET A-430.

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Would therefore appreciate your informing me where LUSTRAGLASS can be secured locally.
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Please send me price list on
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ost can Lustraglass be bought
d shipped to Utah.
G. S.
Chicago

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Please advise me who ca
AGLASS on the Pacific C
land, Me. or Seattle. W
F. H. B.
Denver, Color

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lease send price list
f LUSTRAGLASS.
F. R. S.
Detroit, Mich.

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s there any place in
is part of the country where we may obtain this LUSTRAGLASS?
Y. Lumber Co.,
Miles City, Montana

Gentlemen:
Please gi
of the de
vicinity
purchase

Gentlemen:
Where is the neares ce that I can get your glass that permits the ultra-violet rays to pass?
I am preparing to build and would to use the glass.
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I have been trying to get a "sun-bath" ever since I arrived in California last April. There is so much wind, one needs protection from wind.
California is a long way from Pittsburgh.
Does any dealer carry LUSTRAGLASS in Menlo Park?
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Menlo Park

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sizes 16" x 18" and 16" x 24" flat
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small quantities, either in large or
to know where your closest warehouse
is located. We would also like
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Please advise us
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LUSTRAGLASS is especially interesting to us and I would appreciate
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ours very truly,
E. F. G. Company
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ly received your literature
and sample of LUSTRAGLASS and am
indeed pleased and interested in
same. So beg to inquire if you furnish this product in double strength
grade. A local lumber company is
furnishing sash for new residence.
I do not want this building glazed
with any but LUSTRAGLASS.
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Bellefonte, Pa.
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Gentlemen:
Would like to try some of your LUSTRAGLASS on hot bed sash taking 10 x 12
inch glass. What are the prices
mentioned in single and double strength
per box 50 square feet?
R. Landscape Nursery
Lodi, California

men:
Your advertisement of LUSTRAGLASS
interested me very much. The Council is
contemplating the erection of a number
of schools in which it is possible that
violet ray glass could be used to advantage.
A. C., I.A.A.S.
Gentlemen: Shanghai, China

Gentlemen:
Will you kindly send me your
booklet on LUSTRAGLASS? Will you
also give the address of the nearest dealer?

Gentlemen: Where can we
buy LUSTRAGLASS?
M. R. D.
Dallas, Tex

J. M. C.
B. College,
Lewiston, Maine

I would appreciate very much if you
would kindly advise where LUSTRAGLASS is
to be had in Canada. Have you any representatives in the city of Montreal?
J. P.
Montreal, P Q Canada

Gentlemen:
Send prices on LU
D.S.C.
Bangor,

Gentlemen:
Please send me your book
this violet ray window glass a
quote prices.

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ler in this
here I can
USTRAGLASS.
M. M.

Send prices on LUSTRAGLASS
D. C. S.
Bangor, Maine

J. W. S.
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Gentlemen:
Would like to get prices
oxes or 100 feet of that
AGLASS Double Strength 16
and booklet A-430 for
nhouse.
A. E. P.
Rockford, Ill.

Gentlemen:
Where
LUST

Gentlemen:
Please send me
descriptive literature
on glass that will admit ultra-violet rays.
Give a list of dealers
in this locality.
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Detroit, Mich.

Dear Sirs:
Please send printed
matter, prices, etc.,
who carries LUSTRAGLASS in Philadelphia.
W. B.
S. Gardens
lemen: North Wales, Pa.

building aquar
and would like to
prices on LUSTRA
s.
Yours truly,
L. D.
Ardmore, Okla.

Gentl
You
place
LUSTR
me kn
handl
San F
P

Gentlemen:
We plan to build with
in the next year and
would like to find out
about LUSTRAGLASS.
Would you please tell
us also the names of
dealers in Chicago
where we can buy this
glass.

Gentlemen:
I would be glad to receive
your literature on LUSTRAGLASS.
I am in the building construction
business and am now working on
the plans for remodeling a large
store in our best shopping street.
R. G. L.
Port of Spain,
Trinidad, B.W.I.

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Will you please send me LUSTRAGLASS booklet and also transmission datas for solar radiation?
Also, please, give me address of your dealer in New York City in vicinity of 42nd St., and Lexington Ave.,
V. A.
New Yo

Dear Sirs:
Please send me information and prices on LUSTRAGLASS.
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Chambersburg, Pa.

Gentlemen
We are building a new home and are interested in your LUSTRAGLASS. If you have a representative in Oklahoma, please have him get in touch with us.
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Chickasha, Okla.

Will you please send us your LUSTRAGLASS BOOKLET A-430 and also
prices convering same as we have
had several inquiries for this
glass?
Yours very truly,
S. L. M.
Painesville, Ohio

Gentlemen:
Send me your LUSTRAGLASS booklet and quotation.
I am asked to offer your glass for an important thermal institute in this country. If you are not able to furnish this glass directly, kindly let me know your representative in Belgium.
E. F.
Bruxelles,
Belgium

Dear Sir:
I am very much interested in your new product,
LUSTRAGLASS. Please send me literature
and prices on same.
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Memphis, Tenn.

Gentlemen:
I am to build a new house this spring -- kindly send me your booklet on LUSTRAGLASS.
A. V.
Wrangell, Alaska

Gentlemen:
you kindly send full information re
LUSTRAGLASS? If you have an
please send address.
this week for
tments and
f.o.b.

Gentlemen:
I am putting up a greenhouse. Please
tell me in what size I can get the
LUSTRAGLASS, nearest place of purchase
and price.
Gentlemen:
C. H.

ASS booklet by
return mail? Also let
me know the of
your local dealer.
Thanking you, I am

Dear Sir:
Kindl

Dear Sir:
Send me the
nearest deal
from you

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NO delays due to winter weather
Minimum storage space
Moderate cost

2 EXTRA STORIES
Added to Bloomingdale's

. . . . because of the light weight of GYPSTEEL Floors

"HOW can we add 6 stories to our present building when the original design allows for only 4 more cinder arch floors without extensively reinforcing columns and foundations?"—was the question asked their architects and engineers by executives of Bloomingdale's Department Store in New York.

The answer came back, "Use Gypsteel Pre-Cast Floor Construction, and you can have the two extra floors with a negligible amount of reinforcing." And they did. Starrett & Van Vleck were the architects, Purdy & Henderson the engineers, and Turner Construction Co. the builders.

The light weight of Gypsteel Gypsum Floors solved this difficult problem, as it has in a score of other cases. They provide a flat-ceiling construction with the *lowest dead load* of all fireproof floor systems. They almost always give you more floors than you can get *in any other way.*

Our engineers are available to work out extra floors on new or old buildings with your staff.

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Pre-Cast Gypsum Floors

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Controlled ventilation and low cleaning costs are assured with Williams Reversible Window Equipment. Makes neck-risking professional window cleaners unnecessary—windows washed from *inside* at floor level in half the usual time. Here's proof—prominent buildings all over the country are equipped with this modern reversible window!

For 26 years manufacturers and installers of Reversible Window Equipment

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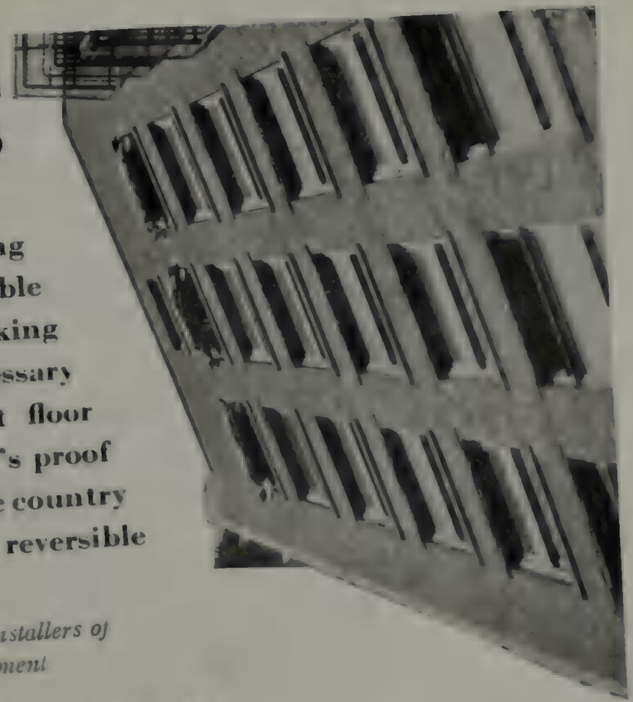

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HERE in these new Salem Gray Shingles, you will find all the mellow beauty of line, texture and color of early America's weatherbeaten roofs of wood—now made available to you for the first time in a substantial, permanent, fireproof roofing material.

If you have not already seen samples of Salem Grays, an Architectural Service Department Representative will gladly show you these unusual shingles. Address Johns-Manville Architectural Service Department, 292 Madison Ave., New York, N. Y.

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2,000 Times—*He tried to cause a Plaster Crack*—AND FAILED!

To verify the fact that Kalman Steel Door Frames insure freedom from plaster cracks in the surrounding wall, one architect proved it for himself.

In a Kalman-built doorway, he slammed a heavy door 2,000 times. Eventually, the lock fell off—the door split—yet the surrounding plaster remained crack-free.

So much a part of the wall does the Kalman Steel Door Frame become—overlapping and closely engaging the side of the tile—providing a positive bond and terminal for plaster—*that the possibility of plaster cracks is eliminated.*

There are 15 advantages with the Kalman Steel Door Frame as compared to any other doorway construction. Write for file folder.

KALMAN STEEL DOOR FRAMES

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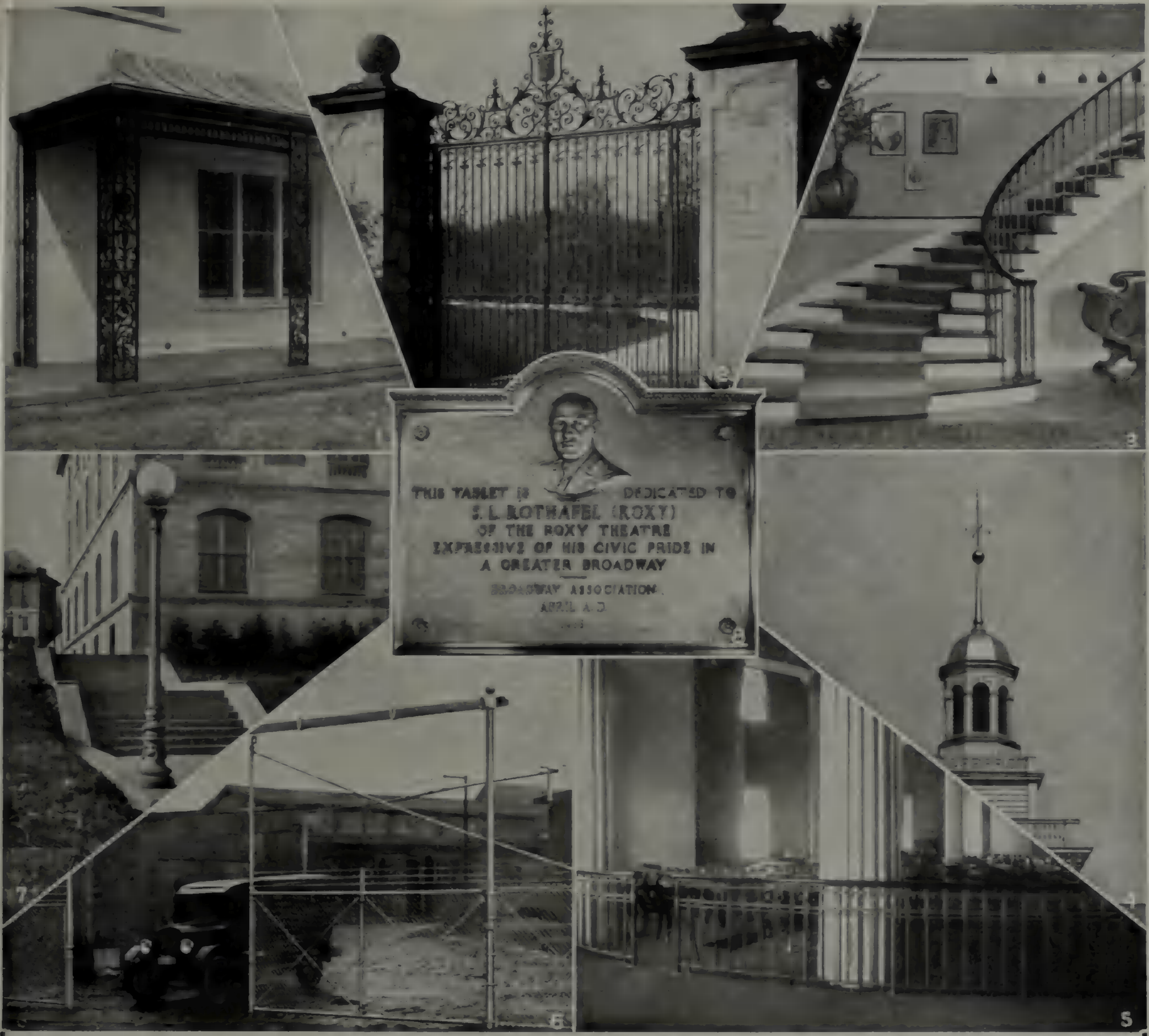

1. Seymour H Knox residence, Aiken, S. C., Peabody, Wilson and Brown, Architects.
2. L. H. Shearman estate, Manhasset, L. I., J. W. O'Connor, Architect.
3. General Howard S. Borden residence, Rumson, N. J., George S. Chappell, Architect.
4. Thos. A. Edison Junior High School, West Orange, N. J., Guilbert & Betelle, Architects.
5. State Capitol Building, Raleigh, N. C., Atwood Nash Inc., Architects.
6. United Piece Dye Works, Lodi, New Jersey.
7. Richmond Borough Hall, St. George, S. I., Carrere and Hastings, Architects.
8. S. L. Rothafel Bronze Tablet, Roxy Theatre, New York.

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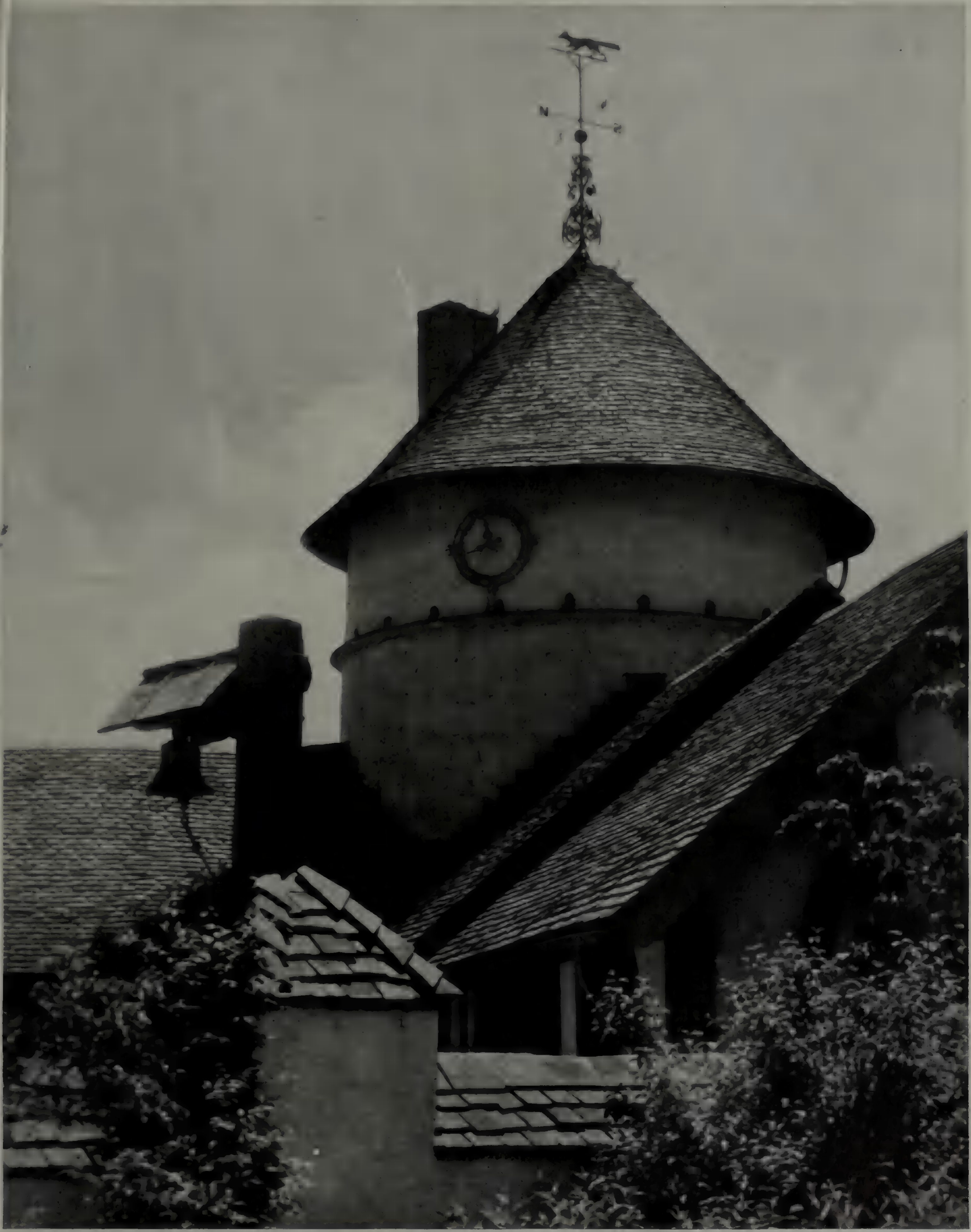

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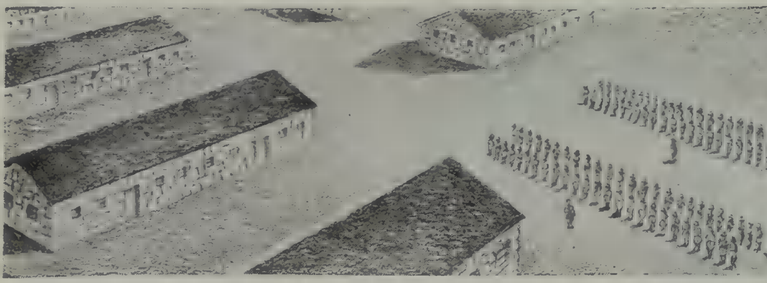

IF the United States Army could be said to worship a fetish in the selection of its equipment, it is that of reliability. Guns, motors, planes, communication devices, must be able to "stand the gaff"—must not fail even under the most difficult conditions. Materials which are purchased and used for training and pre-war activities must measure up to the same standards of dependability that they must meet during actual war times.

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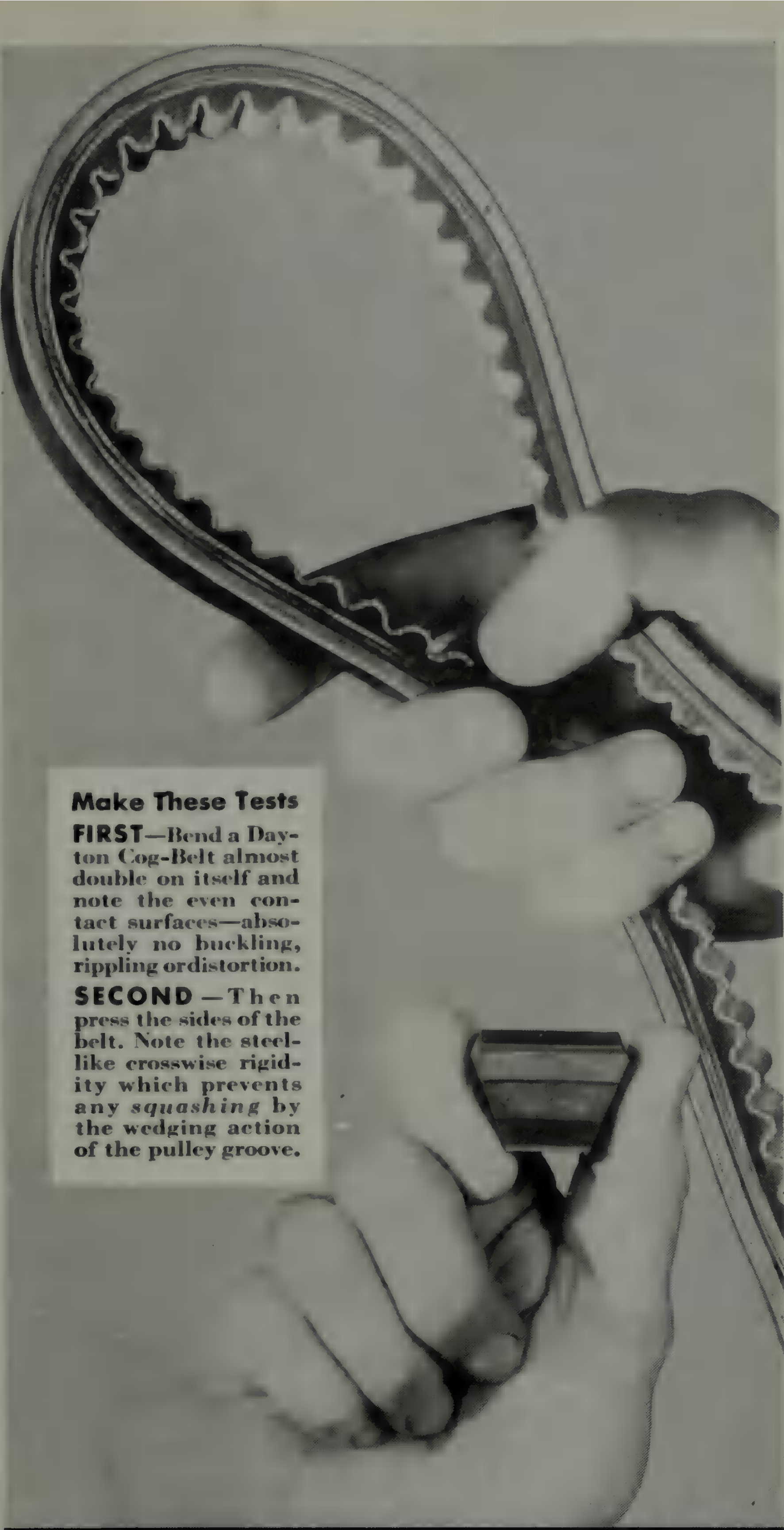

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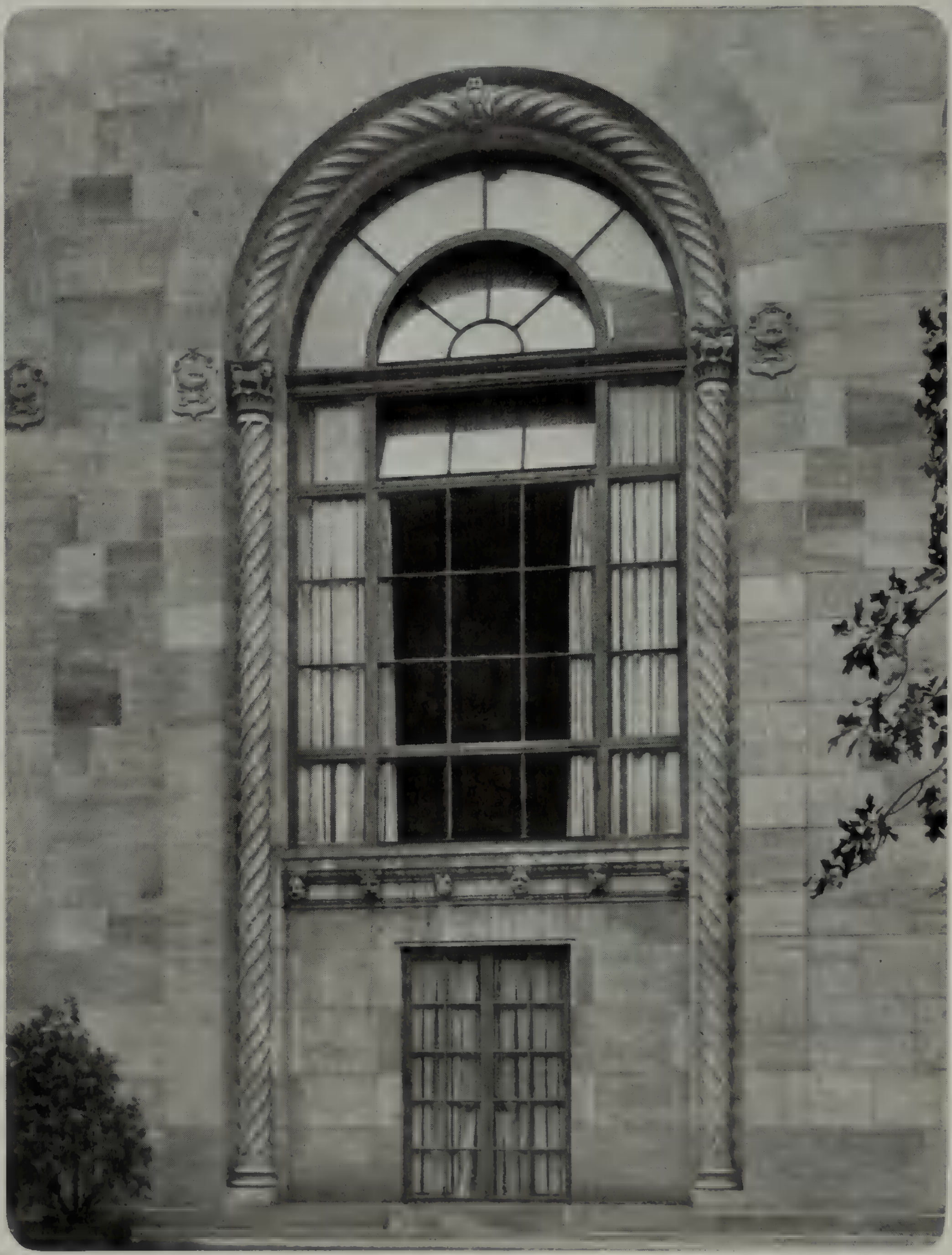

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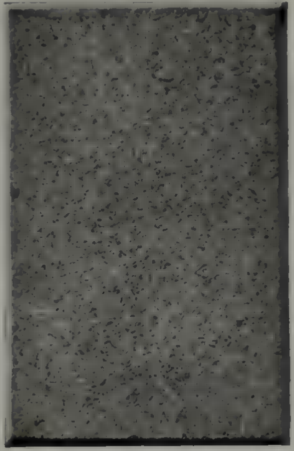

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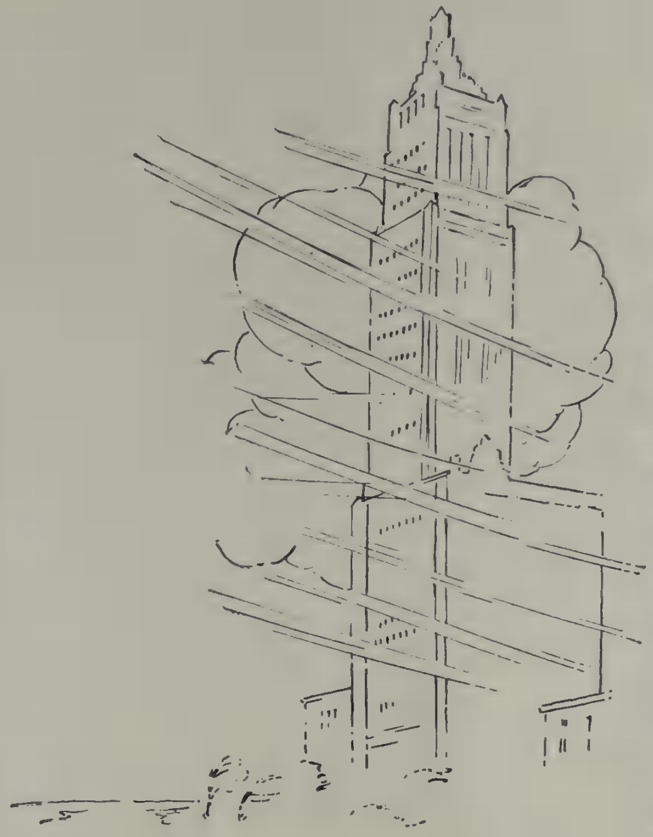

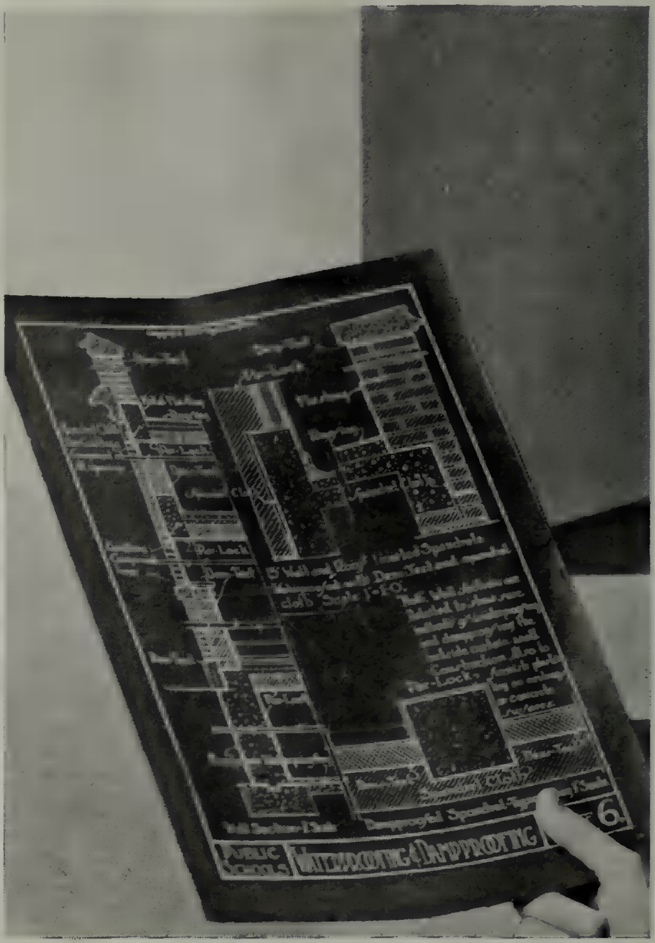

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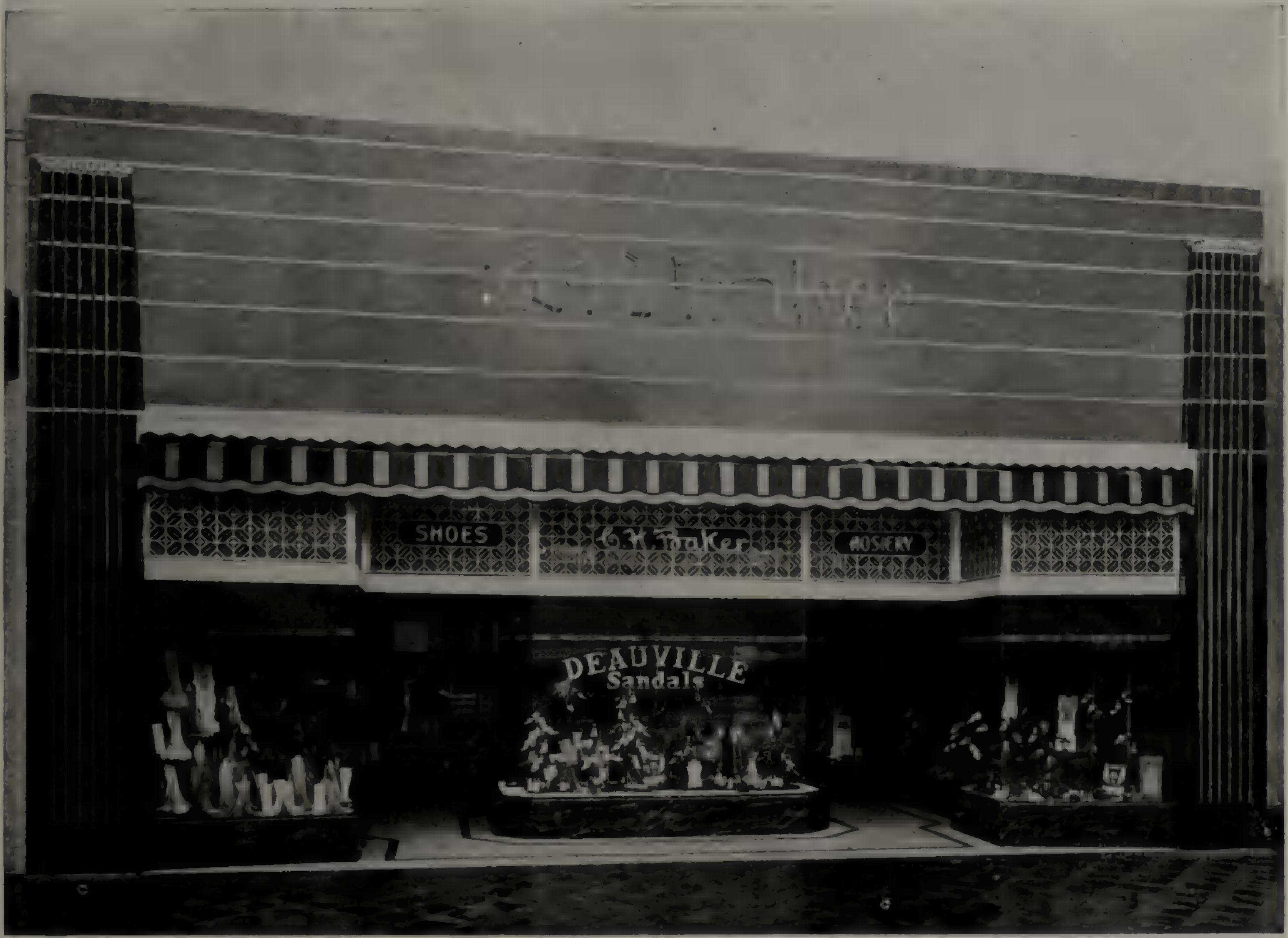

THE MODERNISTIC MOVEMENT

Plate 4

The Baker Shoe Store, on Hollywood Boulevard, has been called the most attractive store front in the Motion Picture City. That is a real tribute, for Hollywood is one of the most beautiful of California Cities.

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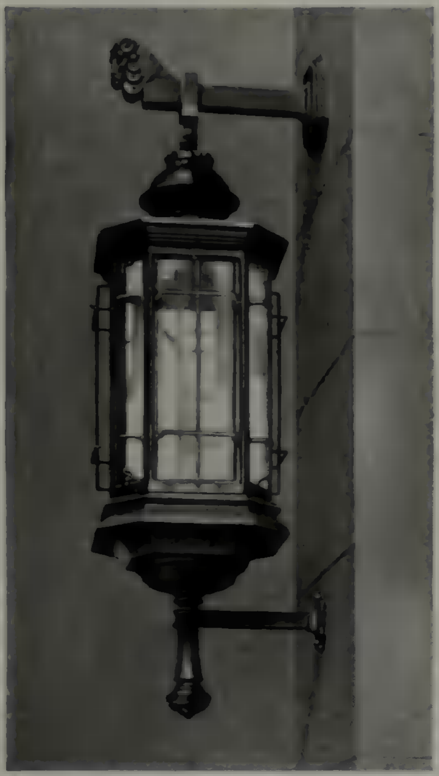

Exterior Lamp Delaware River Bridge
PAUL P. CRET, *Architect*

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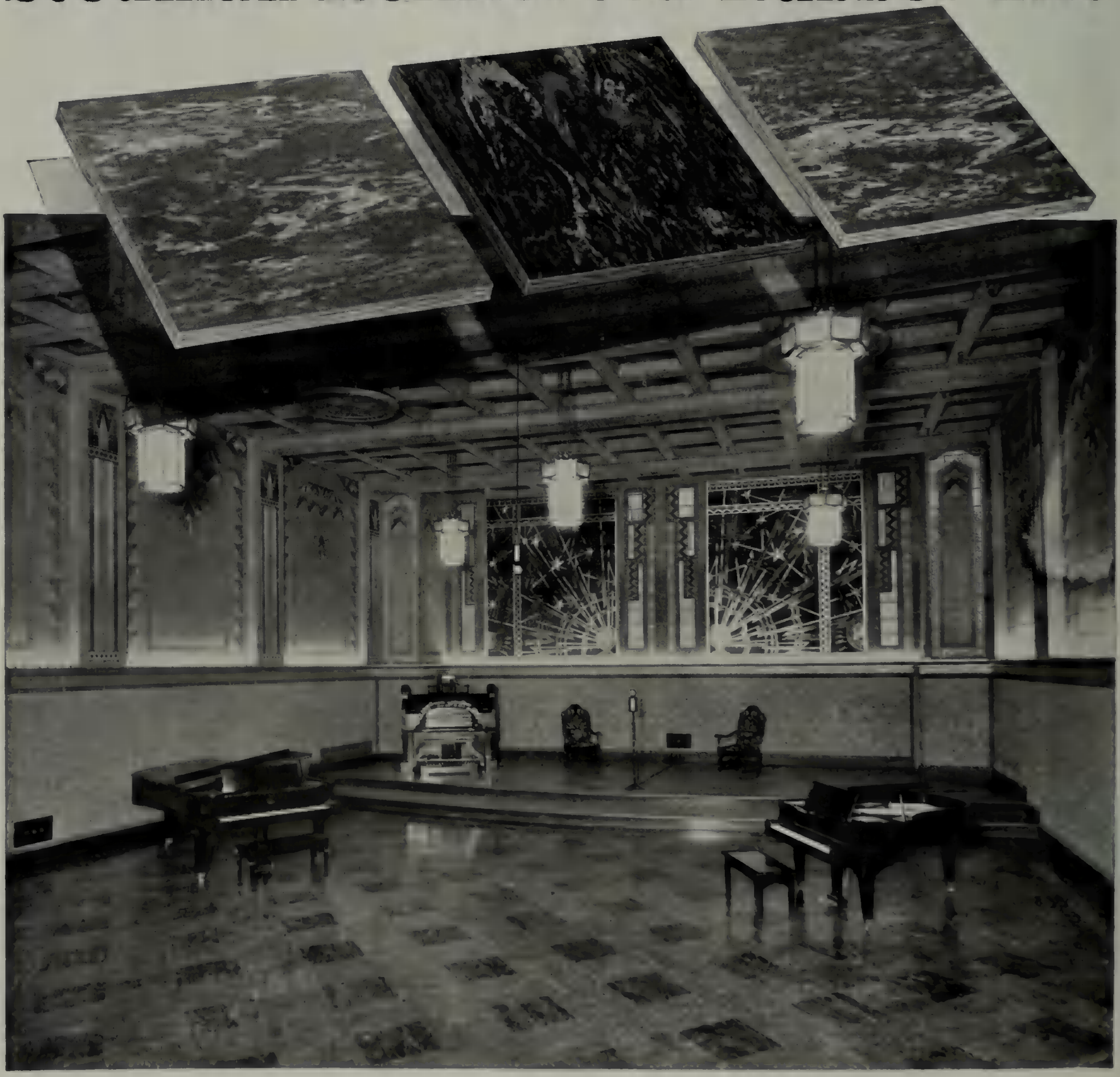

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Interior of a residence at Deerfield, Illinois. Architect, Howard & Frenaye, New York City. Owner and Contractor, C. C. Brackett.

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STEEL CASEMENTS

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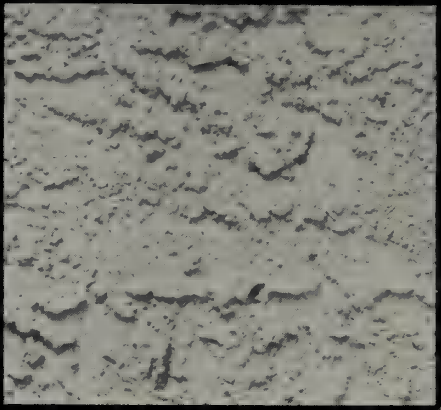

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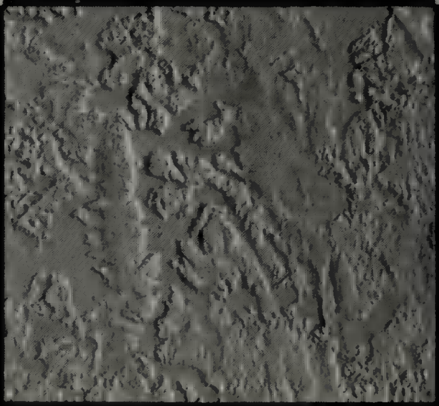

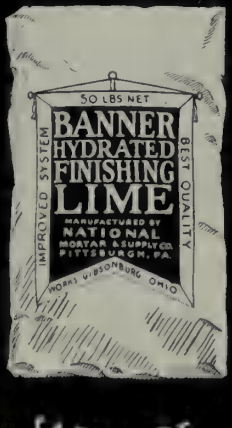

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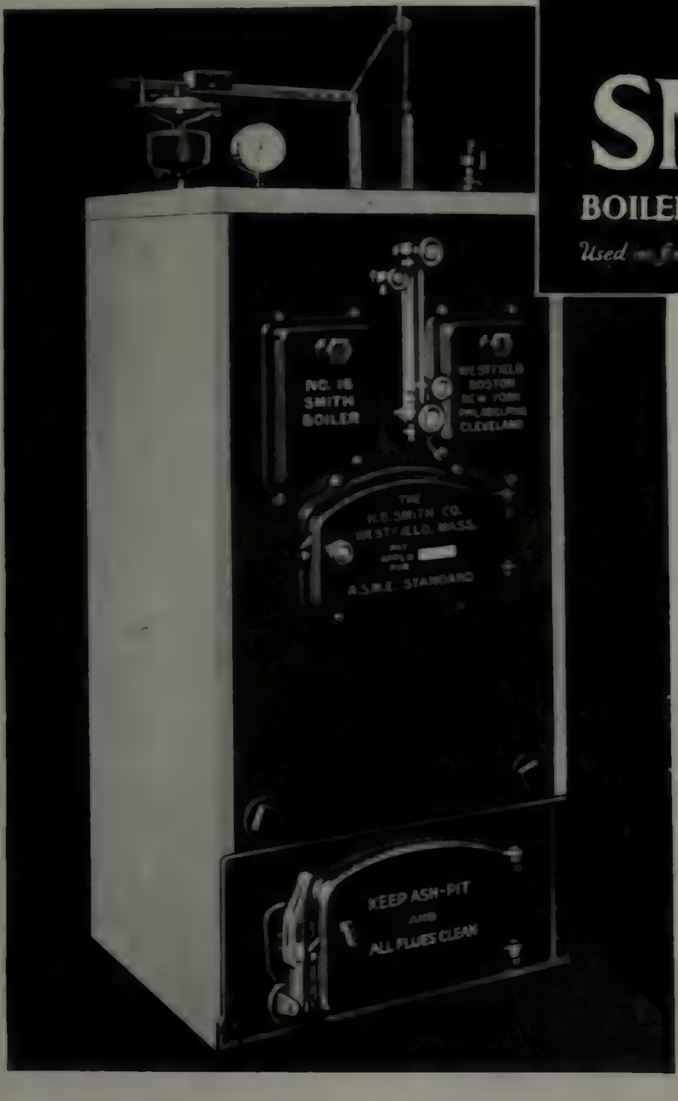
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ANNOUNCEMENTS

Harry W. Bogner, architect, formerly of the firm of Judell and Bogner, architects, has opened his own offices at 759 North Milwaukee Street, Milwaukee, Wis., and would appreciate receiving manufacturers' samples and catalogs.

Charles Dana Loomis, architect, announces the removal of his office to 12 East Pleasant Street, Baltimore, Md.

C. O. Boyce, architect, announces the opening of new offices, 924-26 Chamber of Commerce Building, Cincinnati, Ohio. He will continue the general practice of architecture and engineering, and desires manufacturers' samples and catalogs.

Jock D. Peters, designer, announces that W. F. Ruck, architect, is no longer associated with him. Mr. Peters requests that manufacturers' samples and catalogs be sent to him at 507 Fine Arts Building, Los Angeles.

Norman Hatton, architect and engineer, announces the removal of his offices in the O. R. C. Building to 829 Higley Building, Cedar Rapids, Iowa.

Wilfred Lockyer, architect, announces that his address has been changed from P. O. Box 884, Gulfport, Miss., to Box 2, Route 3, Picayune, Miss.

The firm of F. C. Hirons-F. W. Mellor has been dissolved. Frederick W. Mellor, architect, will continue his practice at 25 West 45th Street, New York City.

Charles M. Lobejager, architect, has discontinued his temporary office at 50 Glen Street, Glen Cove, L. I., and will continue the practice of architecture at 1801 147th Street, Whitestone, L. I.

Harold Holmes Owen, architect, formerly of Owen and Osberg, architects, has opened his own office at 3 North State Street, Concord, N. H., and requests that manufacturers' literature be sent to that address.

A CORRECTION

In the November issue the house of G. Lyman Paine, Jr., should have been credited to Mr. Paine as architect instead of to John Crosby Moore.

Abbott

PARKER MORSE HOOPER

The Record is happy to announce that Parker Morse Hooper has joined its staff as Consulting and Contributing Editor. Mr. Hooper will collect information on certain timely problems which he is especially well qualified to investigate. Six years of responsibility for editing The Architectural Forum has given him a wide knowledge of sources of professional news and a still longer experience as a practicing architect has clarified his judgment as to practical applications of news. Beginning with the February issue he will begin to publish news reports on such subjects as methods currently employed with success for obtaining clients; economies achieved by architects who have studied operating costs from new angles, and similar topics related to the business of the average architectural practice.

CALENDAR OF EVENTS

Dec. 1	Competition for "esthetic improvement" in design of water tanks, sponsored by Chicago Bridge and Iron Works, Alvert M. Saxe, 430 N. Michigan Avenue, Chicago, architectural advisor.
Dec. 1-6	Ninth National Exposition of Power and Mechanical Engineering, Grand Central Palace, New York City.
Dec. 5-6	The Florida Association of Architects will meet at Fort Meyers, Florida.
Dec. 11	Color lighting. Papers and demonstrations of recent developments. Illuminating Engineering Society. Westinghouse Lighting Institute, Grand Central Palace, 480 Lexington Avenue, New York City.
Dec. 16	Address by Arthur Holden, Junior League of the N. Y. Society of Architects. Apply to L. E. Jallade, 15 East 47th Street, New York City.
Jan.-Feb. 1	International Exhibition of Persian Art, Royal Academy, London.
Jan. 8	Underwater illumination. Demonstration of lighting of swimming pools. Illuminating Engineering Society. New York Athletic Club.
Jan. 15	Nominations for Le Brun Traveling Scholarship should be received before this date by the committee, Room 530, 101 Park Avenue, New York City.
Jan. 15-30	Exhibition of cameragraphs by Palmer Shannon, photographer, at the Architectural League, 115 East 40th Street, New York City. Exhibits will include reproductions of architectural drawings and will show the work of New York renderers for the past year.
Jan. 23.	Beaux-Arts Annual Ball, Hotel Astor.
Feb. 1	Closing date for entries for Rome Prize competition. Apply to Roscoe Guernsey, executive secretary, American Academy in Rome, 101 Park Avenue, New York City.
Through Feb.	Annual exhibition of the Architectural League of Greater Miami, Florida.
March 30-April 4	House and Garden Exposition, Grand Central Palace, New York City.
April 18-25	Fourth Biennial Architectural and Allied Arts Exposition, Grand Central Palace, New York City.
June 1-5	International Town Planning and Housing Federation Congress, Berlin.

THE JANUARY ISSUE

Gillies

L. P. HOLLANDER STORE, NEW YORK CITY

For the interiors of this fashionable Fifth Avenue store, the designers, Eleanor LeMaire and Jock D. Peters, have created for the display of merchandise a background which is at the same time both simple and luxurious. The various store units—perfume room, toiletries, evening bag room, powder room, jewelry, leather goods, and the like—will be illustrated with exceptionally fine large photographs.

Hedrich-Blessing

PORTFOLIO OF OFFICES

This selection of interiors will be similar to the portfolio of shops and small stores appearing in the current issue but featuring establishments that are seen less often by the general public. A series of views of the office of Joseph Urban, well-known architect and stage designer, will be shown. Other illustrations will include an office by Percival Goodman, the reception room and executive offices of a perfume shop by Thompson and Churchill, and a Wall Street brokerage office by Edward I. Shire, architect.

TECHNICAL NEWS AND RESEARCH: GYMNASIUMS

The problems of gymnasium planning and construction are changing with the development of broader programs of physical education and the development of new social values. In the study of these new determinants well-known authorities in physical education and gymnasium building have cooperated. Topics discussed in the article include greater diversity of gymnasium activities; elimination of the individual stall-shower and locker systems, gallery running tracks and spectator space; decreased use of wall-attached apparatus, with subsequent possibilities of new wall materials, such as cork, tile and glass; increased storage space for additional bleachers; monitors or sawtooth roof construction for skylights.

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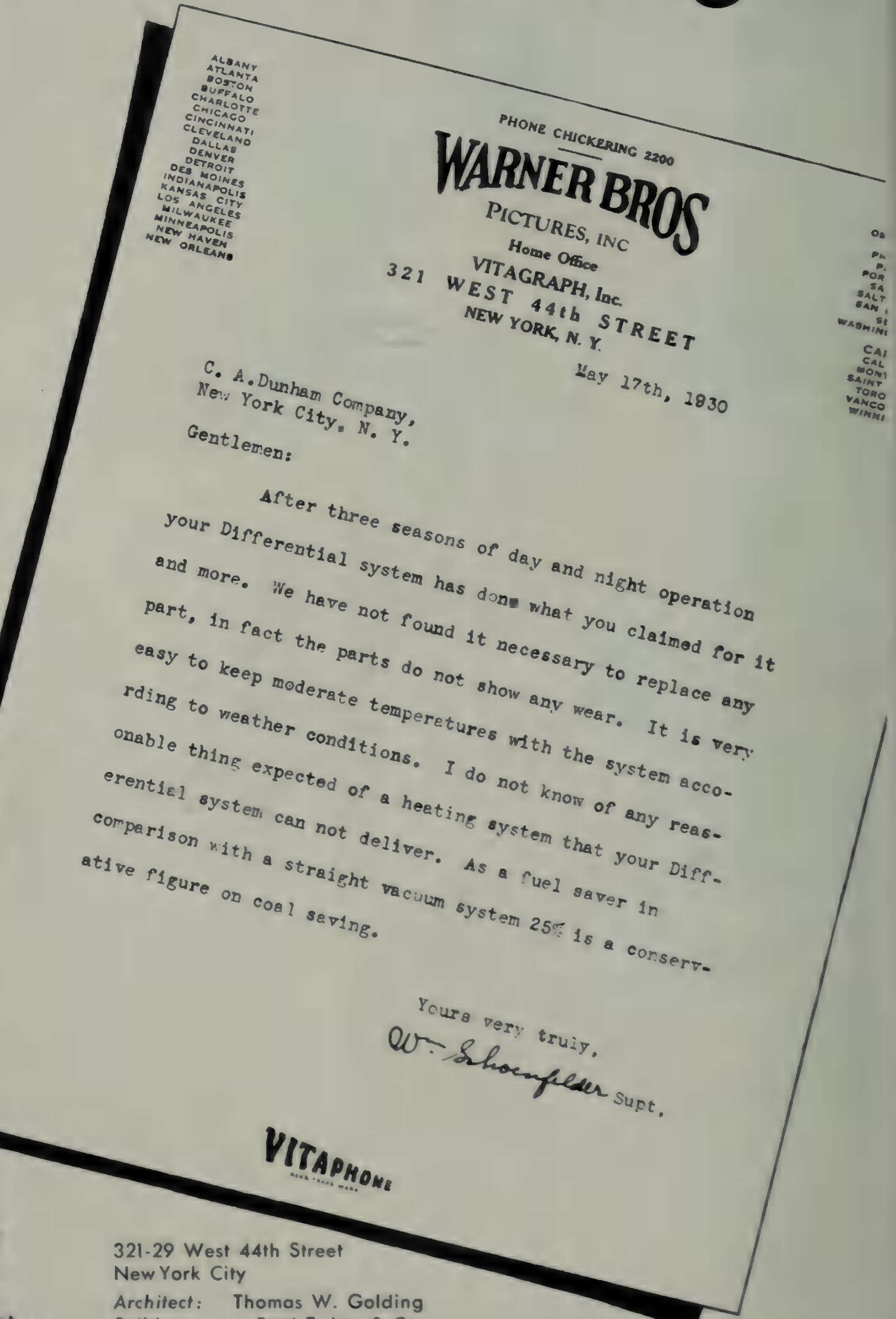

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THE ARCHITECTURAL RECORD

AN ILLUSTRATED MONTHLY MAGAZINE OF
ARCHITECTURE & THE ALLIED
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TO
VOLUME LXVIII

JULY—DECEMBER
1930

PUBLISHED BY
F. W. DODGE CORPORATION
115-119 WEST FORTIETH STREET, NEW YORK CITY

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THE ARCHITECTURAL RECORD

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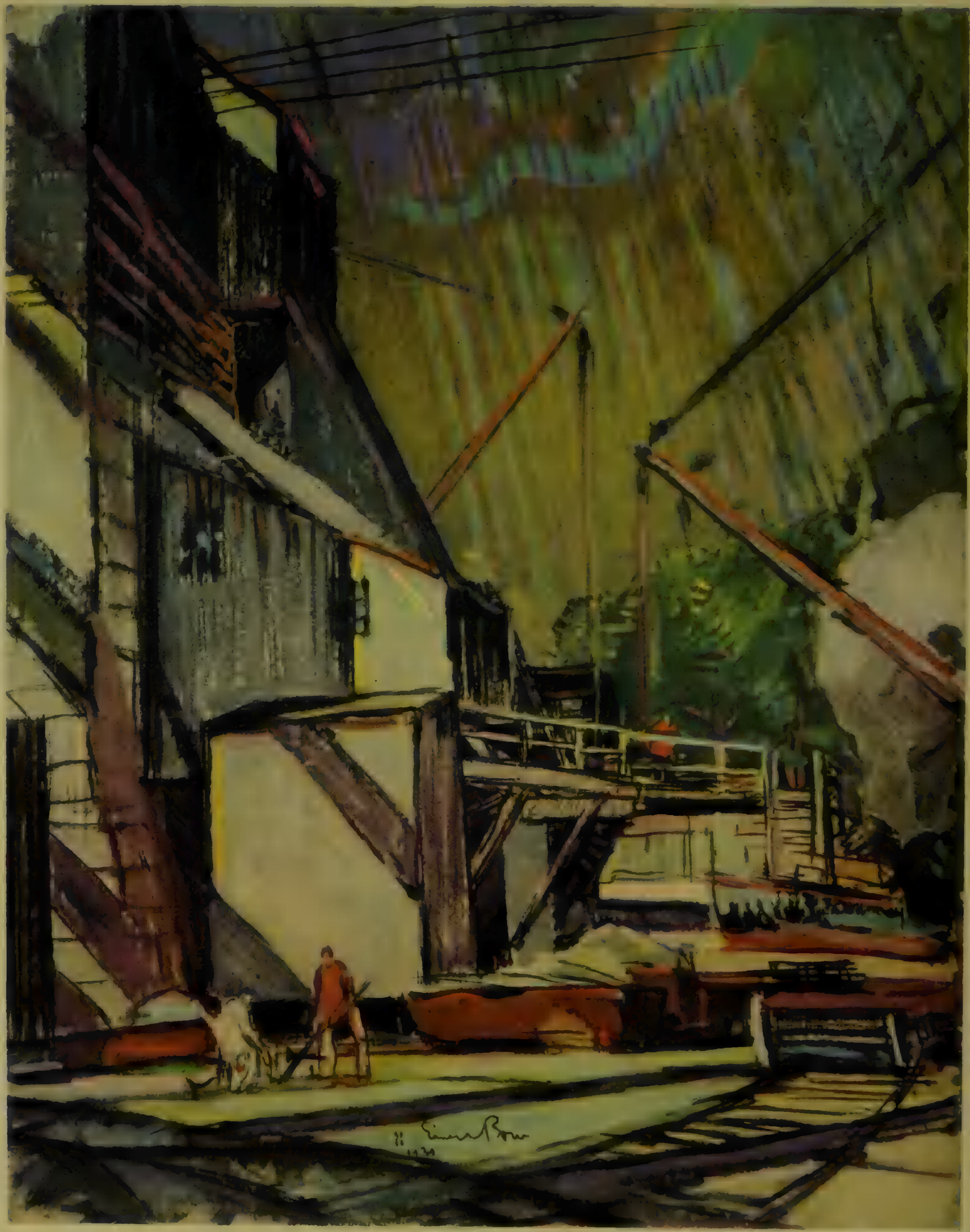

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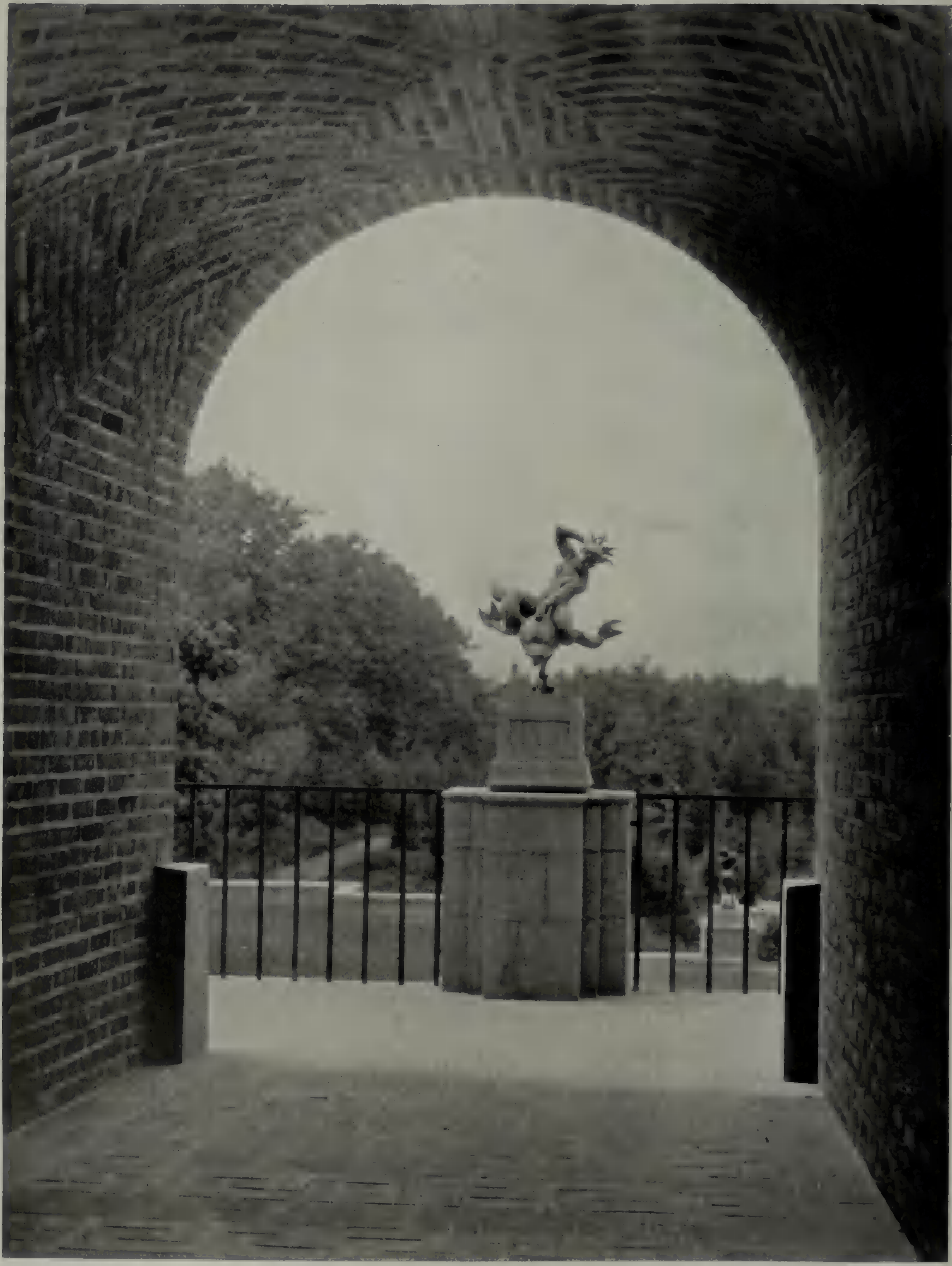


CRANBROOK ACADEMY OF ART
BLOOMFIELD HILLS, MICHIGAN
ELIEL SAARINEN, ARCHITECT

"Triton," by Carl Milles

THE ARCHITECTURAL RECORD

AN ILLUSTRATED
MONTHLY MAGAZINE
OF ARCHITECTURE

VOLUME 68 NUMBER 6 DECEMBER 1930

CRANBROOK ACADEMY OF ART BLOOMFIELD HILLS, MICHIGAN

ELIEL SAARINEN, ARCHITECT

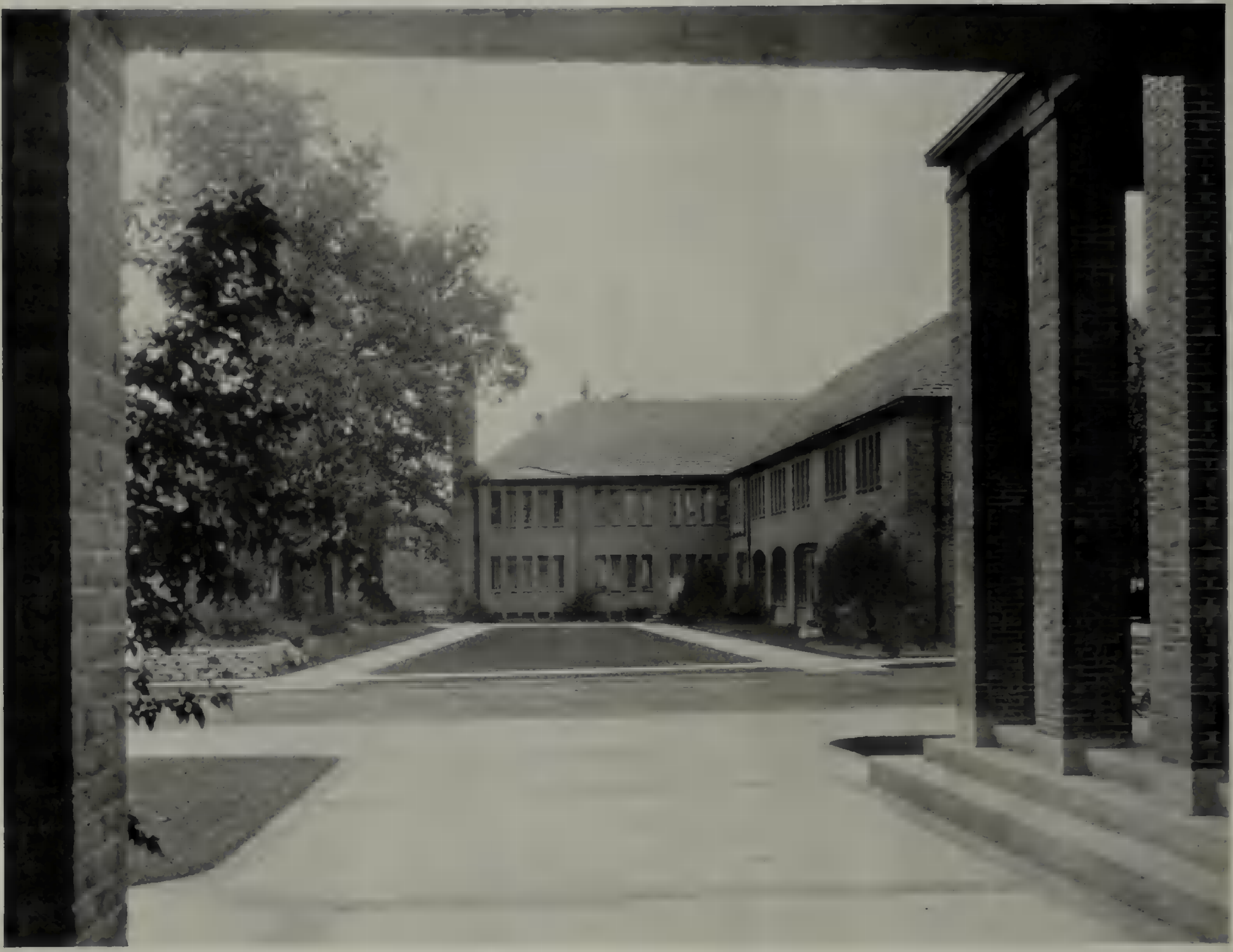
A new principle of art instruction and craftsmanship is offered in the Cranbrook Academy of Art, now being built through a bequest by George G. Booth on a rural estate of 260 acres in Bloomfield Hills, 19 miles north of Detroit.

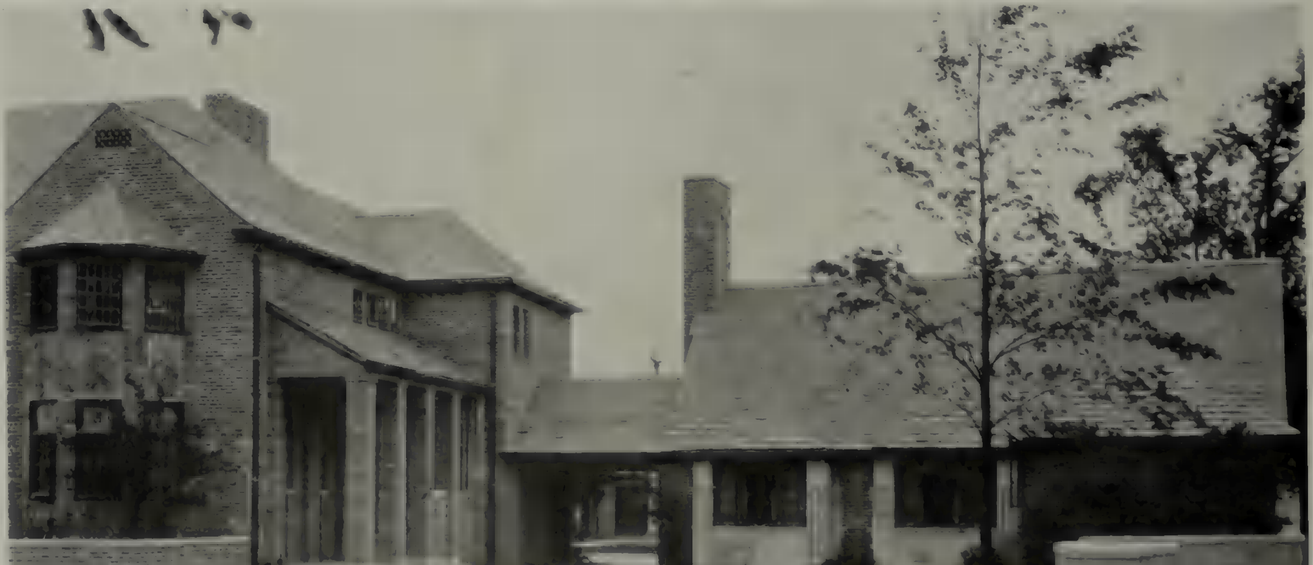
Here, in a congenial atmosphere, may come the younger art workers from schools, trades and professions—to study and develop without the necessity of considering means of livelihood. Also mature architects, painters, sculptors and craftsmen will occupy studios at the academy in order to carry out projects that require research and surroundings favorable to creative effort. The academy is described by Mr. Booth not as a place for study but as a place for work offering the benefits of association with other skilled workers.

Facilities for printing, sculpture, rug making, furniture making, textile designing and metal working are to be offered as well as for architecture and painting. Work in these fields will be carried over directly into industry.

Visiting artists have at their convenience numerous apartments, a dining hall, studios, drafting rooms, experimental workshops, a working library, a museum and lecture rooms. These artists will participate in building the school under the supervision of Eliel Saarinen, architect of the entire project. Carl Milles, the Swedish sculptor, is one of the group who have already settled at Cranbrook.

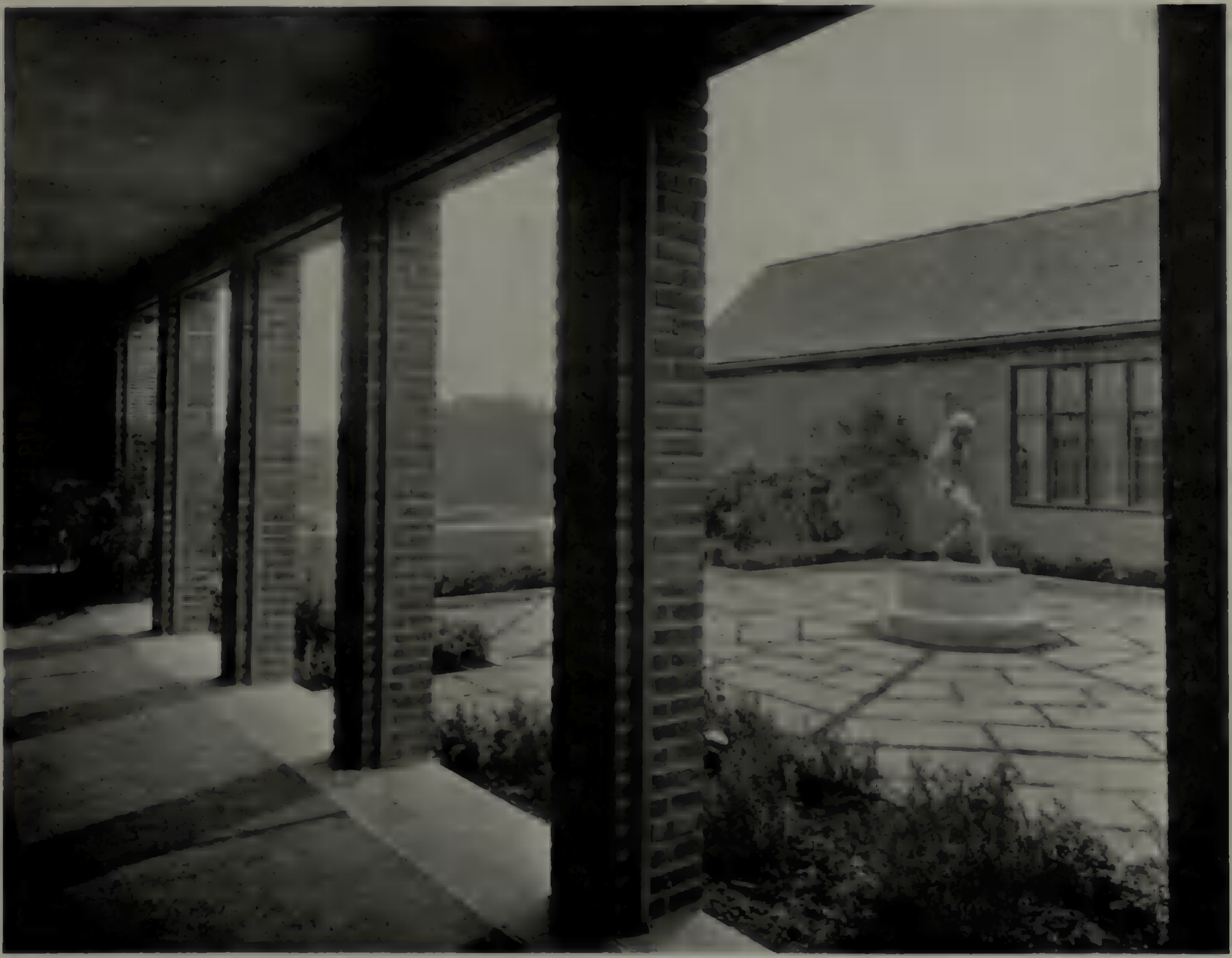
Young men with promise of artistic talent will be given encouragement to occupy studios and to work under the guidance of more experienced men. This work will be entirely contemporary. The academy is not to be considered as a national art center but rather, by the encouragement given to contemporary artists by placing before them facilities for the working of the various arts and the collected examples of outstanding sculpture, painting, architecture and other crafts, to be considered as exemplifying a principle of instruction applied to a locality which, after experimentation, may be applied to other communities.



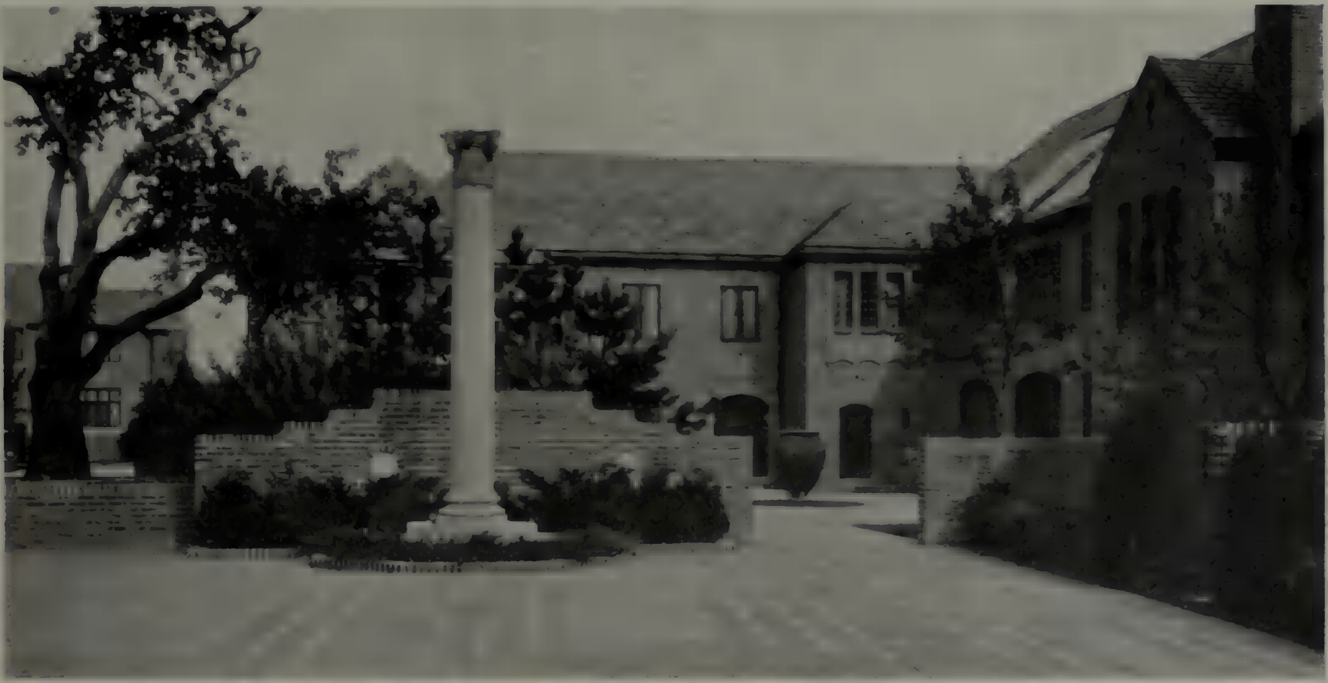


CRANBROOK ACADEMY OF ART
BLOOMFIELD HILLS, MICHIGAN
ELIEL SAARINEN, ARCHITECT

Work Shops

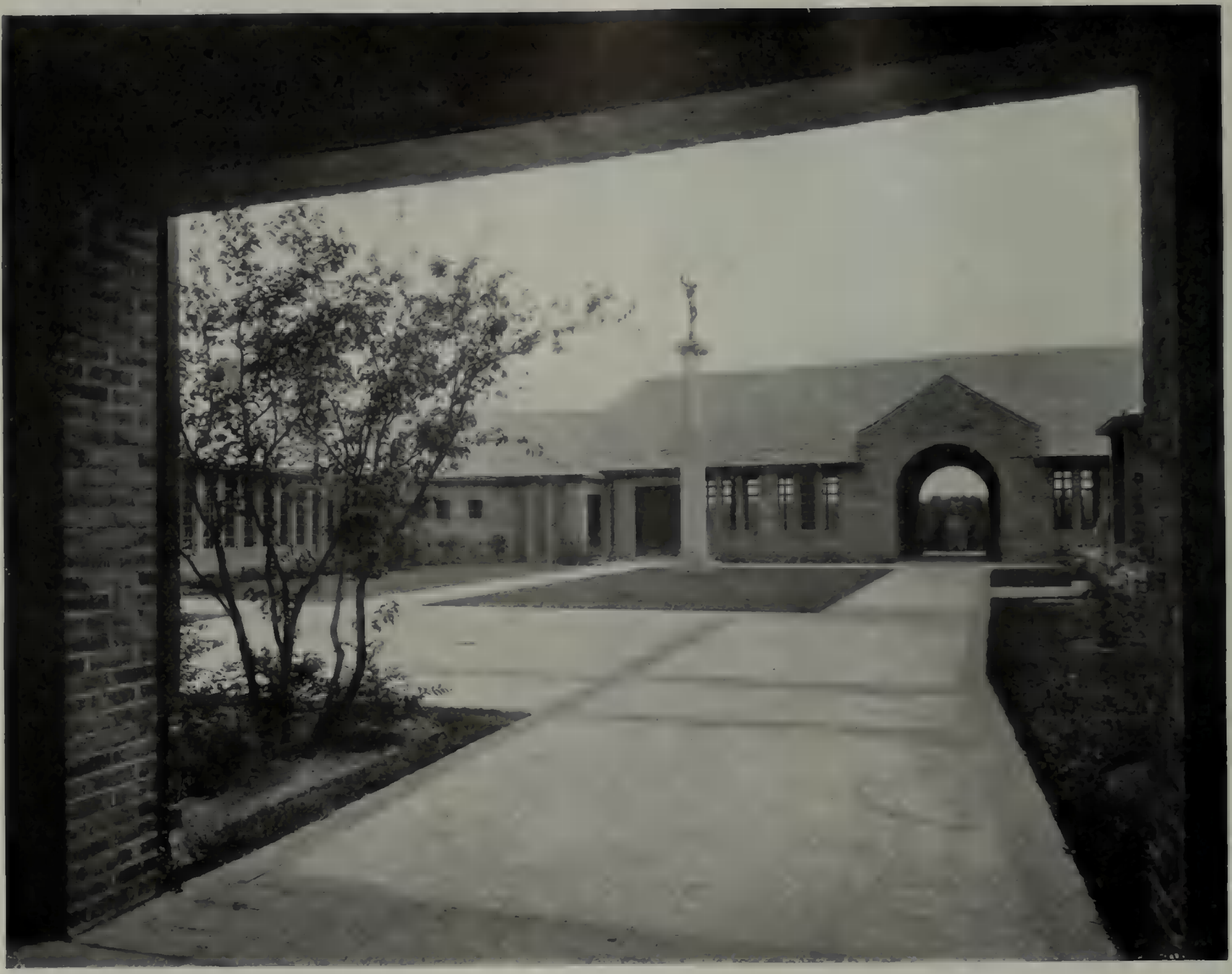


Courtyard of Saarinen residence

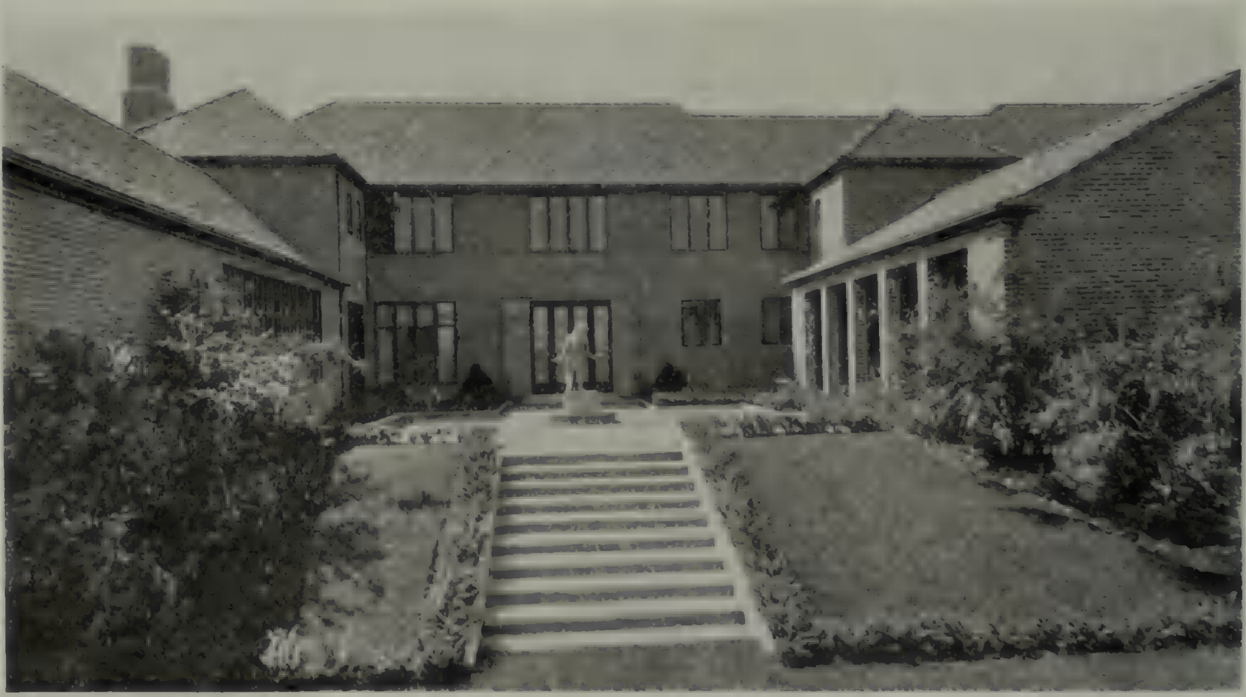


CRANBROOK ACADEMY OF ART
BLOOMFIELD HILLS, MICHIGAN
ELIEL SAARINEN ARCHITECT

Museum



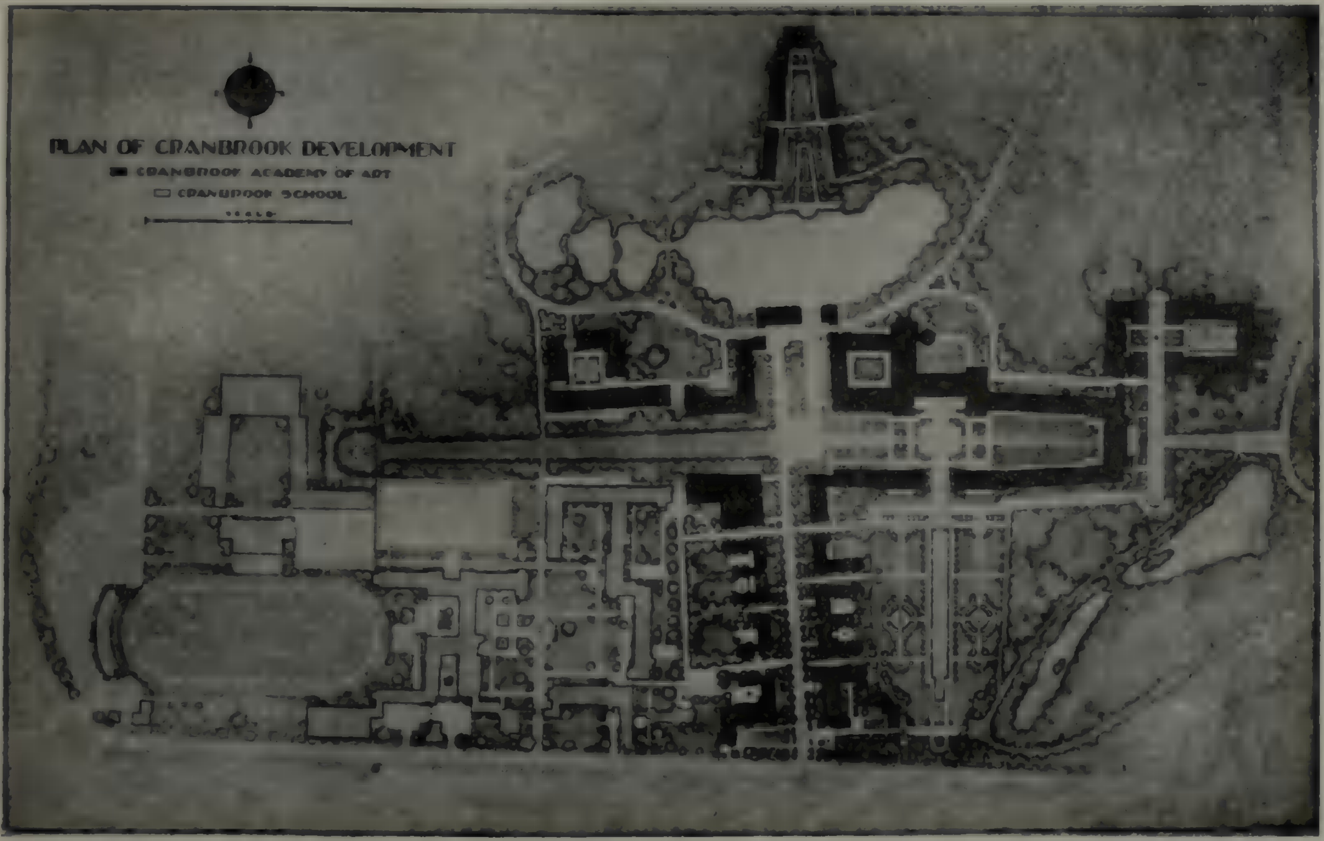
Work Shops

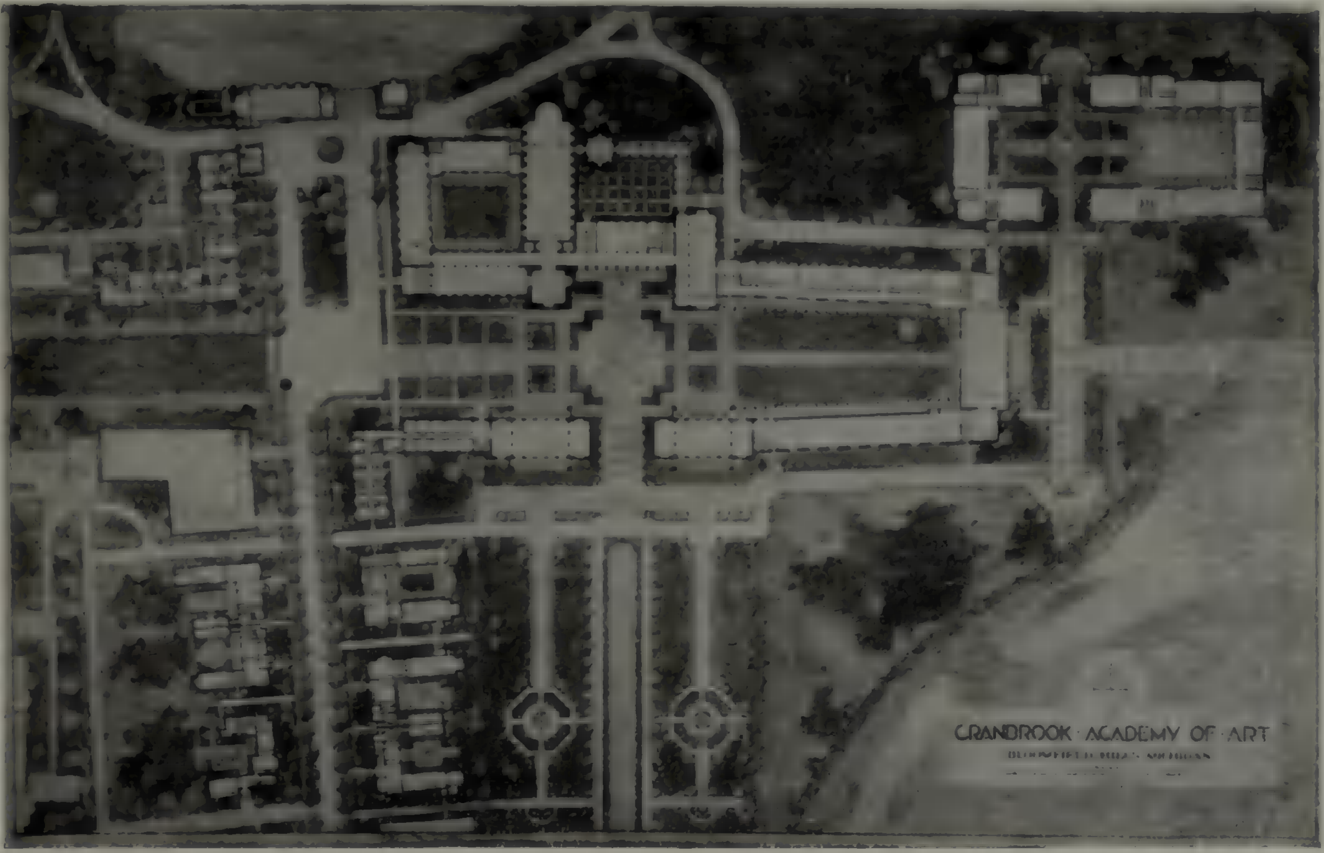


J. W. Hughes

CRANBROOK ACADEMY OF ART
BLOOMFIELD HILLS, MICHIGAN
ELIEL SAARINEN ARCHITECT

Saarinen residence





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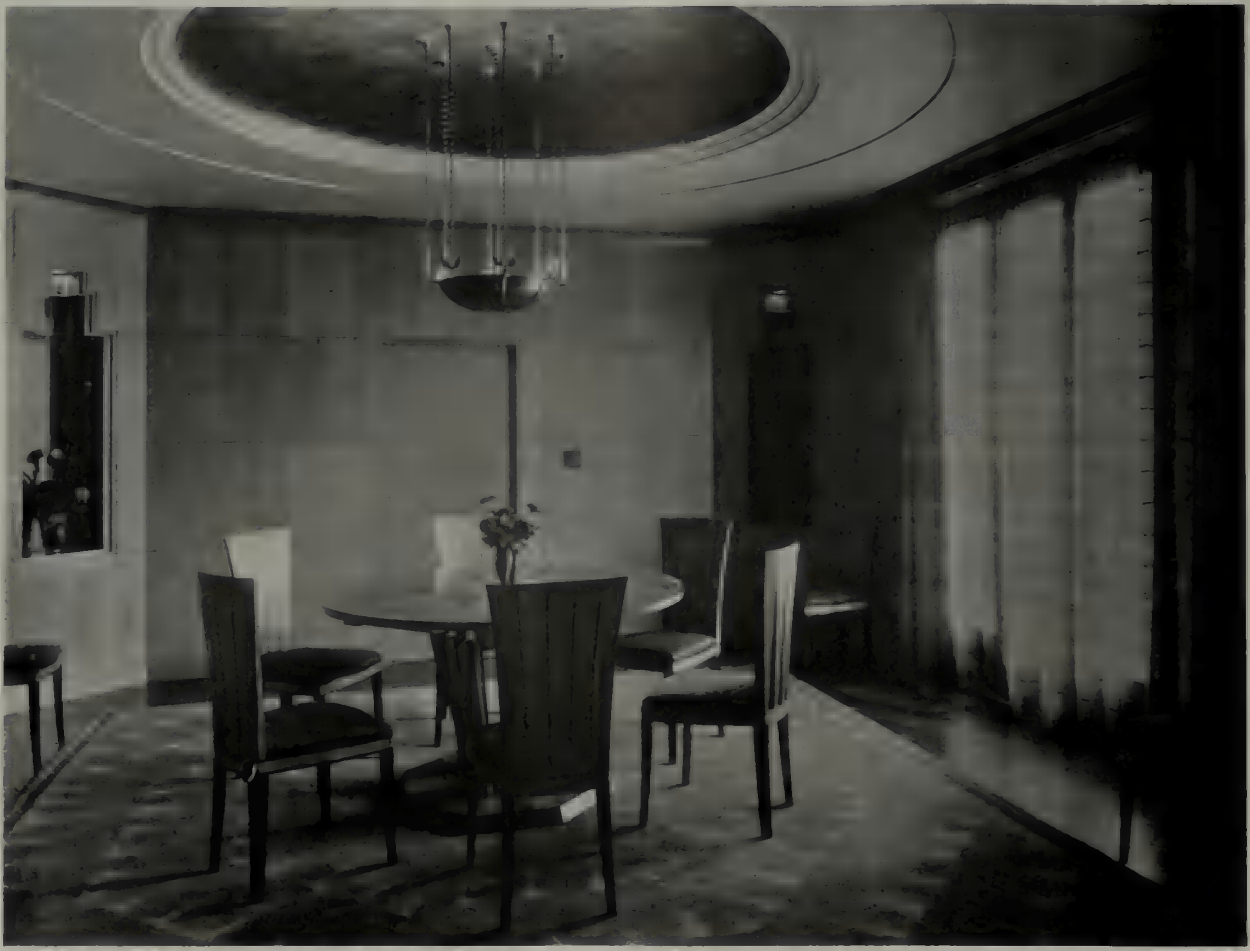
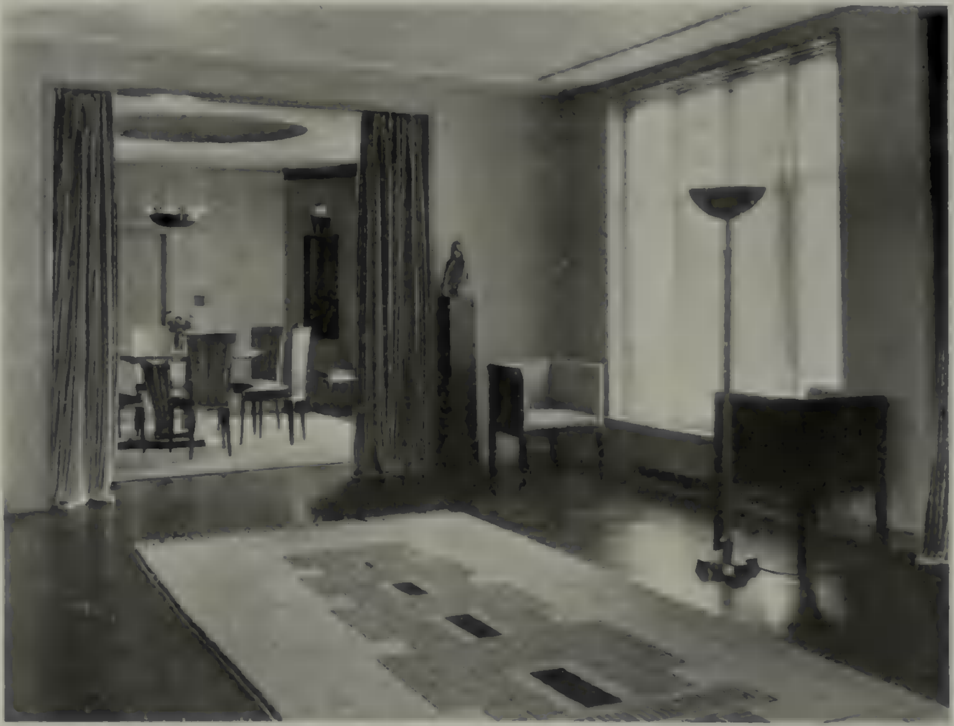
ELIEL SAARINEN, ARCHITECT

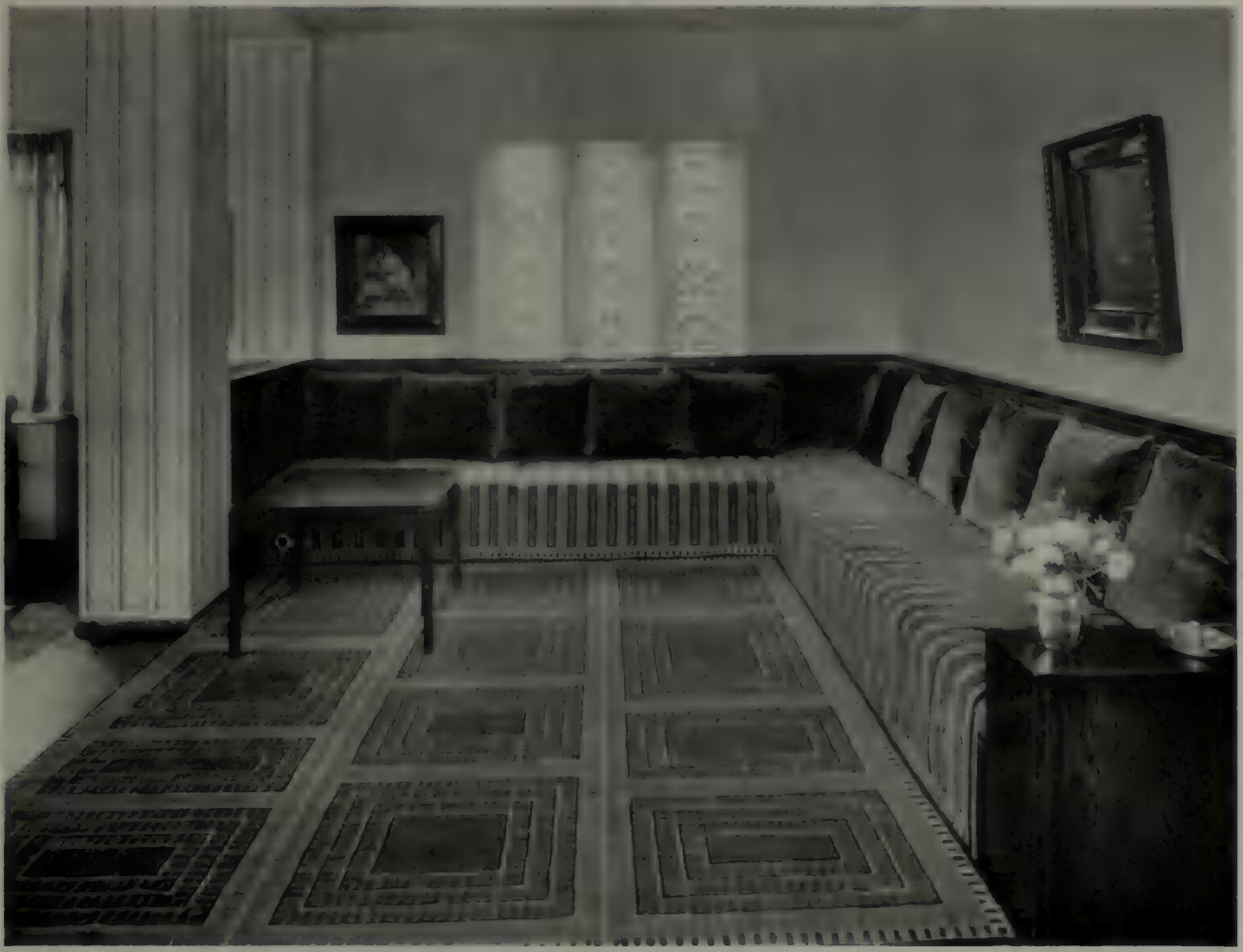


Dining room

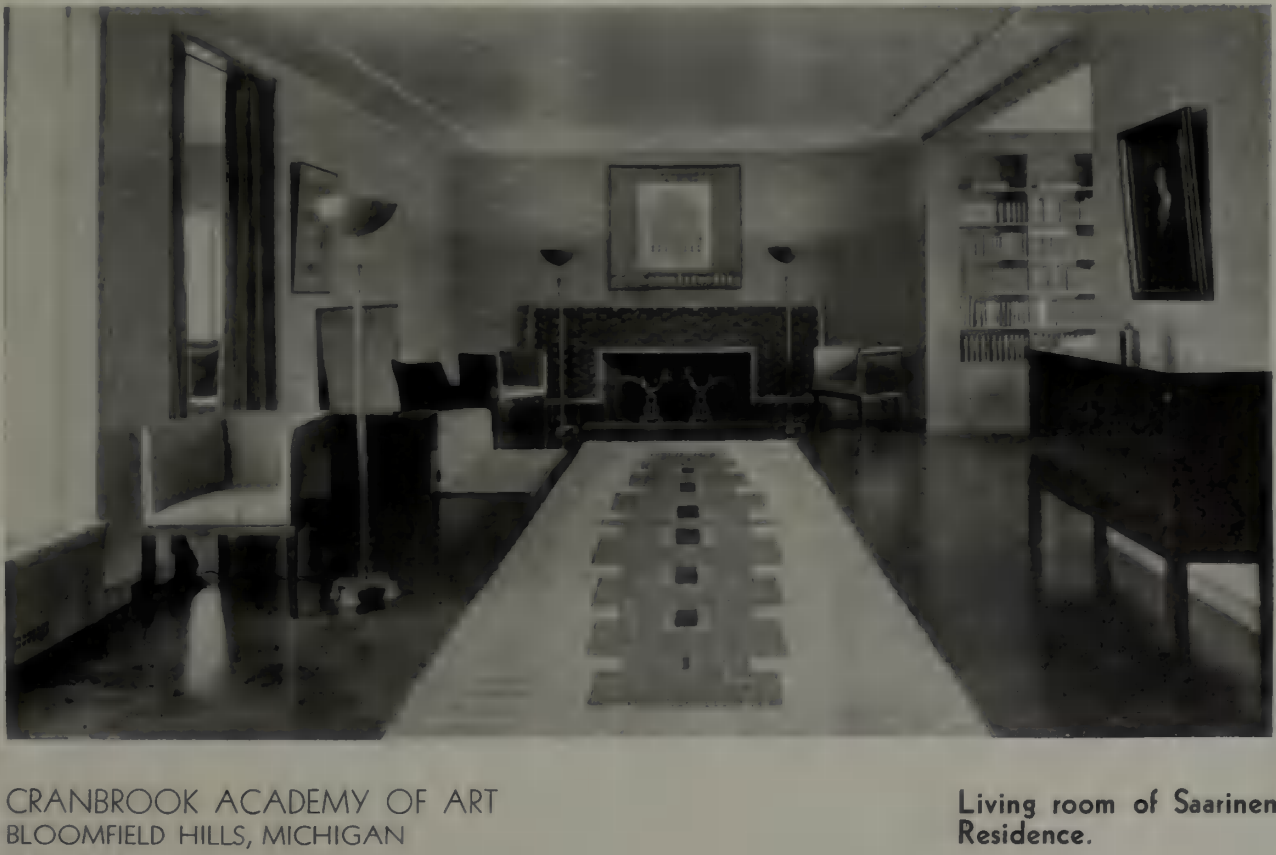


CRANBROOK ACADEMY OF ART
BLOOMFIELD HILLS, MICHIGAN
ELIEL SAARINEN, ARCHITECT

Living room of Saarinen residence, dining room adjoining.



Studio corner



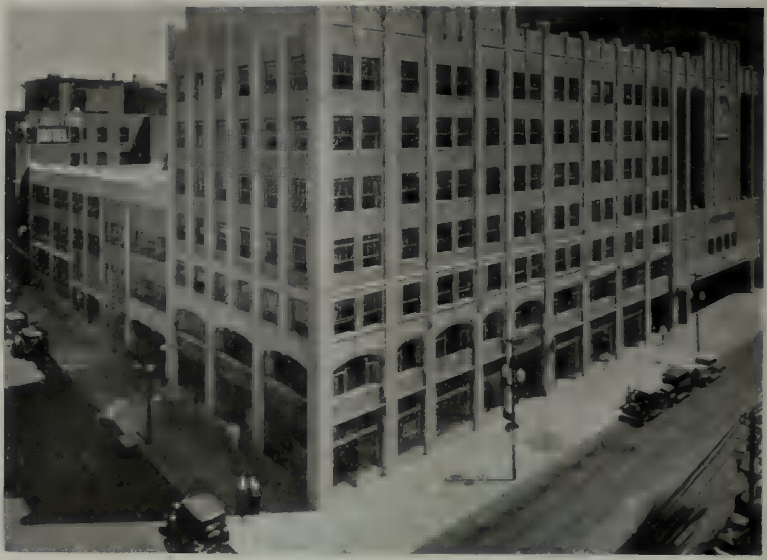
CRANBROOK ACADEMY OF ART
BLOOMFIELD HILLS, MICHIGAN
ELIEL SAARINEN, ARCHITECT

Living room of Saarinen Residence.

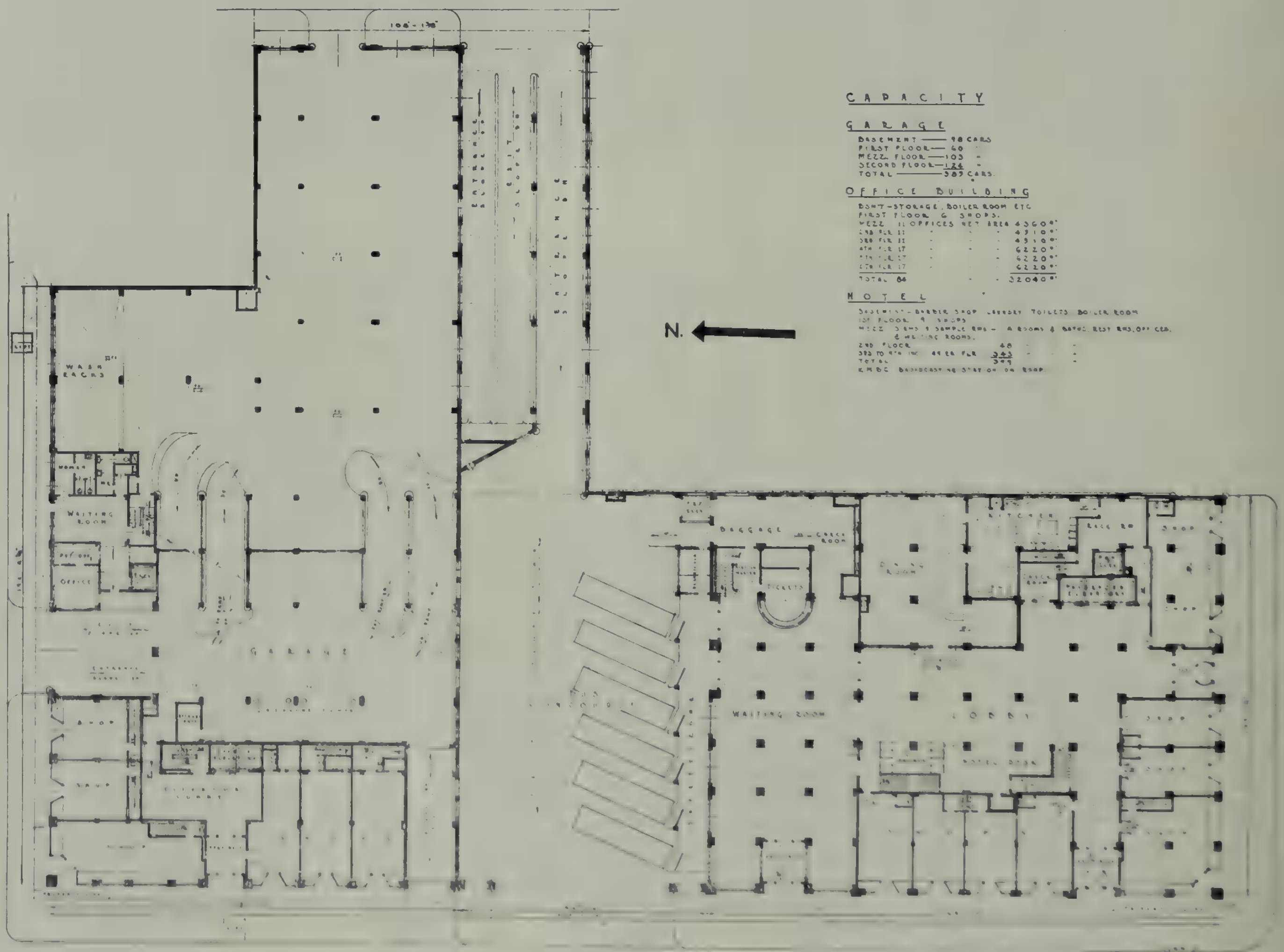
AUTO-BUS STATION
HOTEL
OFFICE BUILDING
GARAGE
STORES

UNDER ONE ROOF

KANSAS CITY, MISSOURI
WIGHT AND WIGHT, ARCHITECTS



Anderson

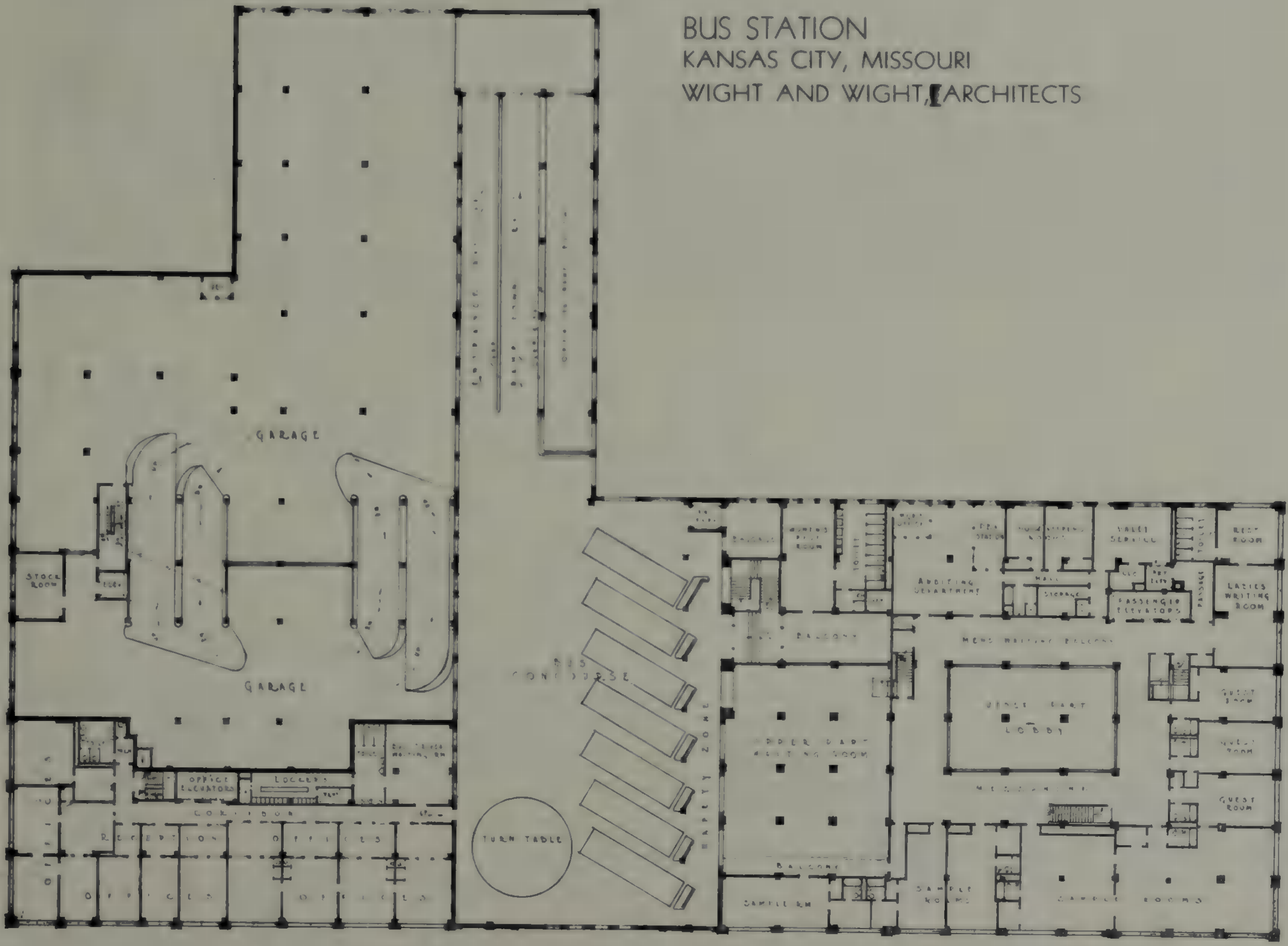


This cluster of commercial buildings—hotel, office building, garage and stores—is grouped closely around an auto-bus station. It is a new type of depot, created by needs of auto-bus travel and differing in many respects from the railway station.

The development occupies an entire block, 375 feet in length, in Kansas City, Mo. It includes a ten-story class A hotel of four hundred rooms with baths and newest equipment; a seven-story office building, a union bus station, and a garage with a storage capacity of four hundred cars. There are also stores and lesser shops at outer street level and within the building. Passengers from the station platform come into the waiting room direct from each concourse where comfort rooms and conveniences have been arranged for the traveller.

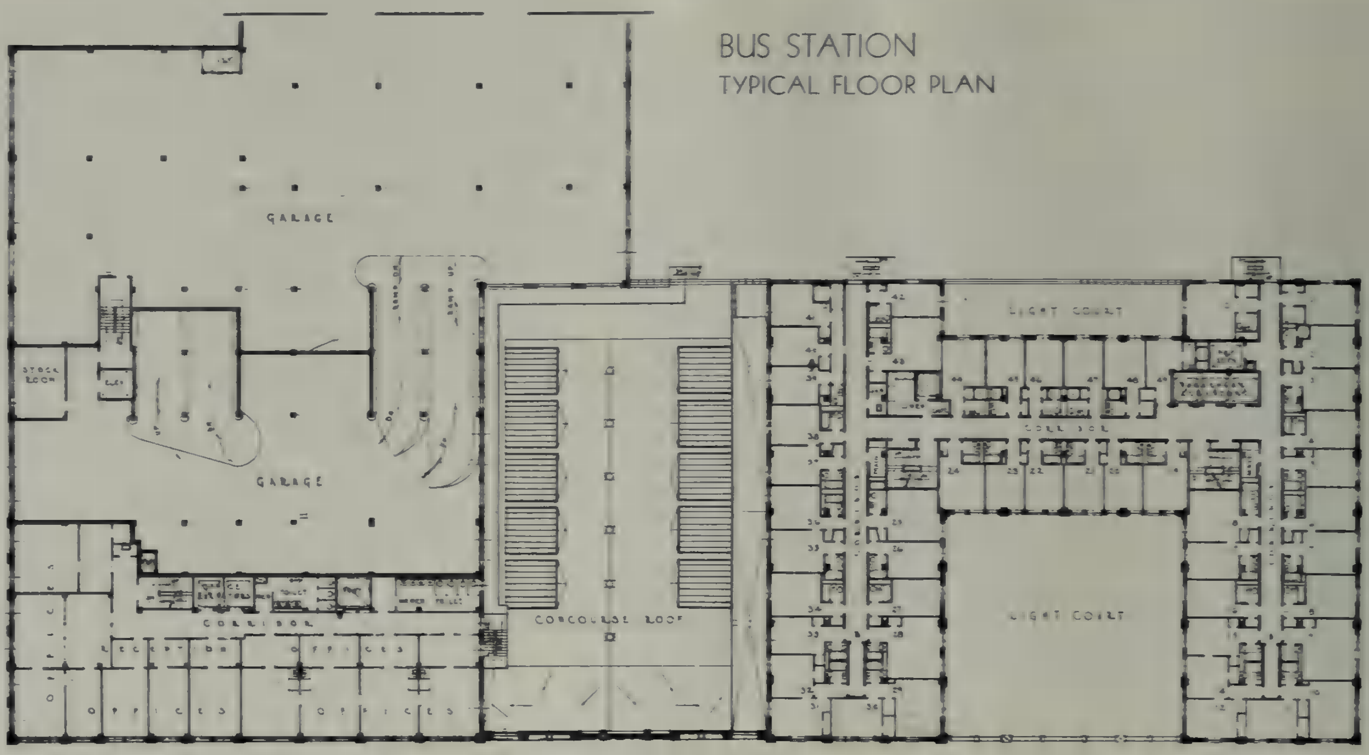
The garage has a dual purpose, serving usual local needs for parking and storing cars; it also serves the tenants of the office building who may drive into the garage and go directly to the office building. There are easy grades in relation to the street levels and a non-interfering circulation of plan.

Buildings are constructed of reinforced concrete, with the exception of the long spans of the bus station between the hotel and office building where steel is used.



BUS STATION
KANSAS CITY, MISSOURI
WIGHT AND WIGHT, ARCHITECTS

BUS STATION
TYPICAL FLOOR PLAN



BUS STATION
KANSAS CITY, MISSOURI
WIGHT AND WIGHT, ARCHITECTS

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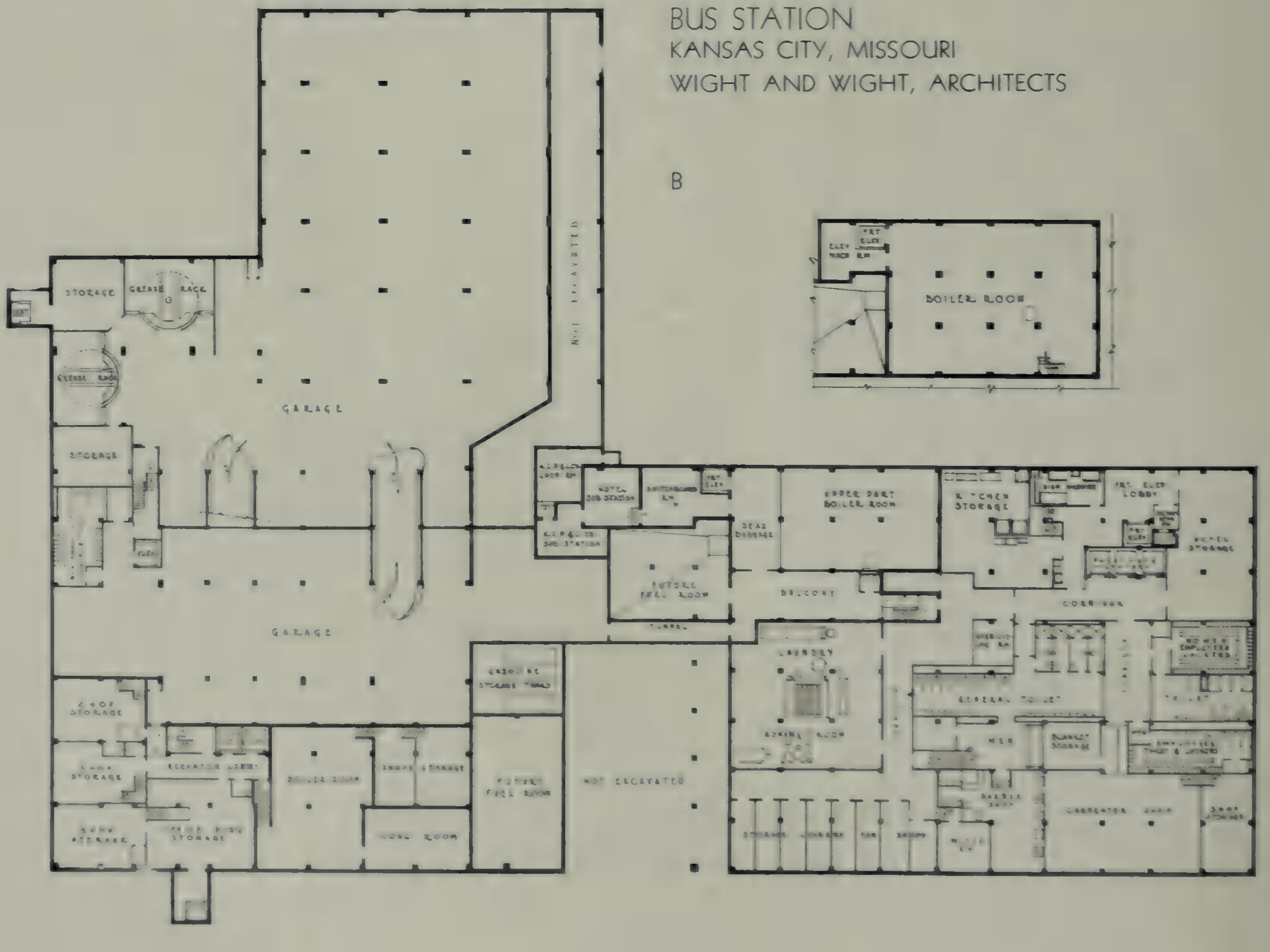
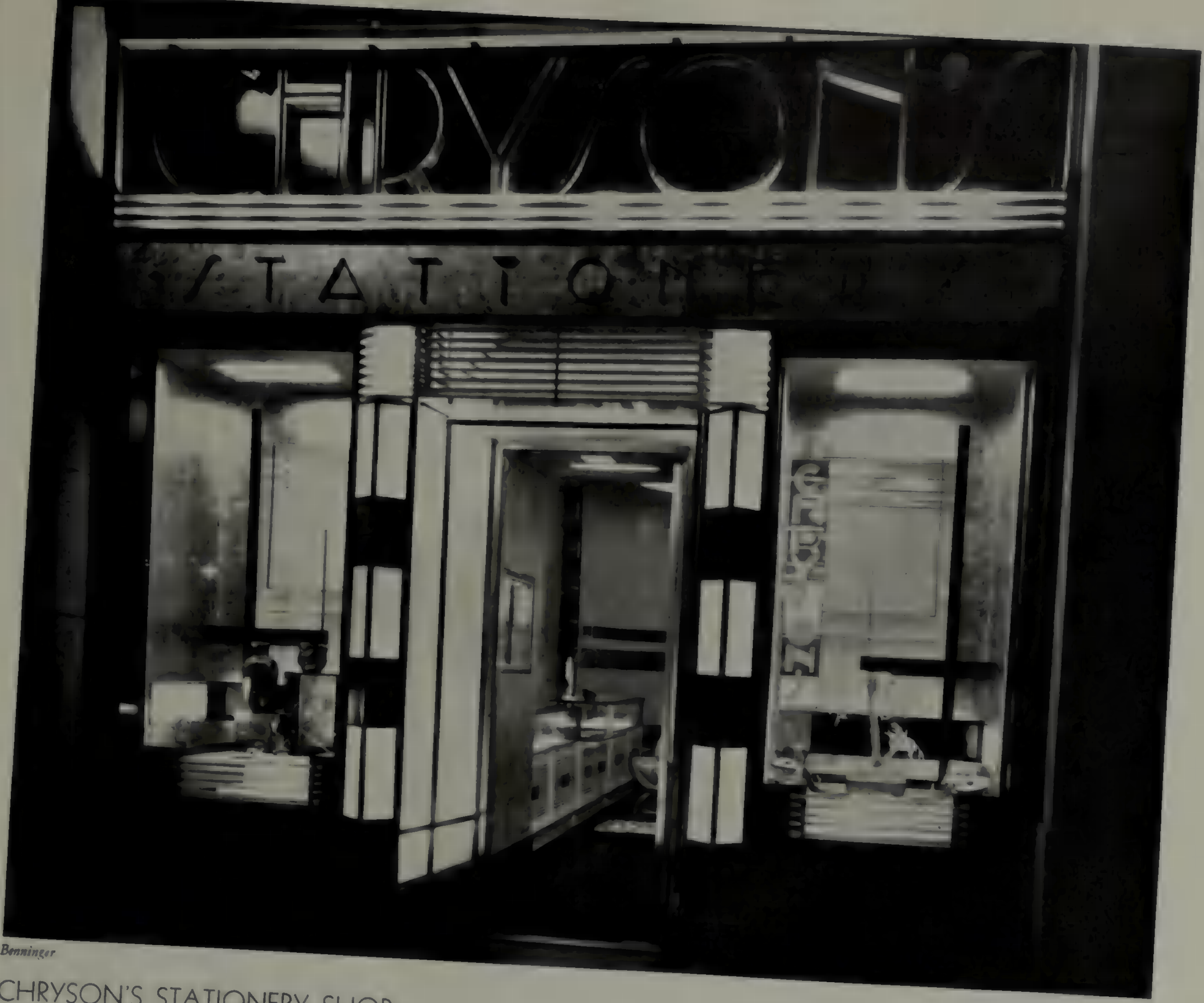
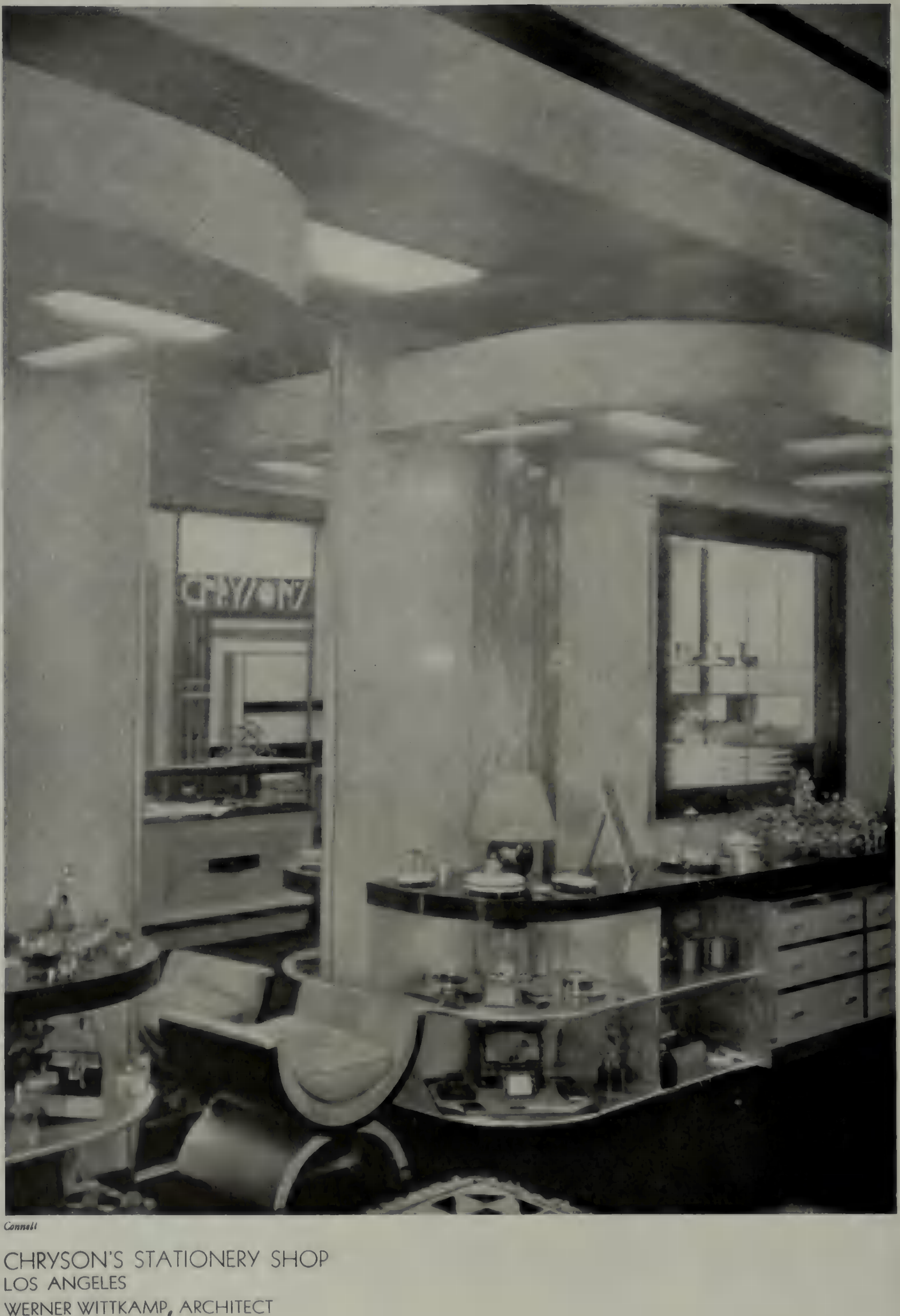




Benninger

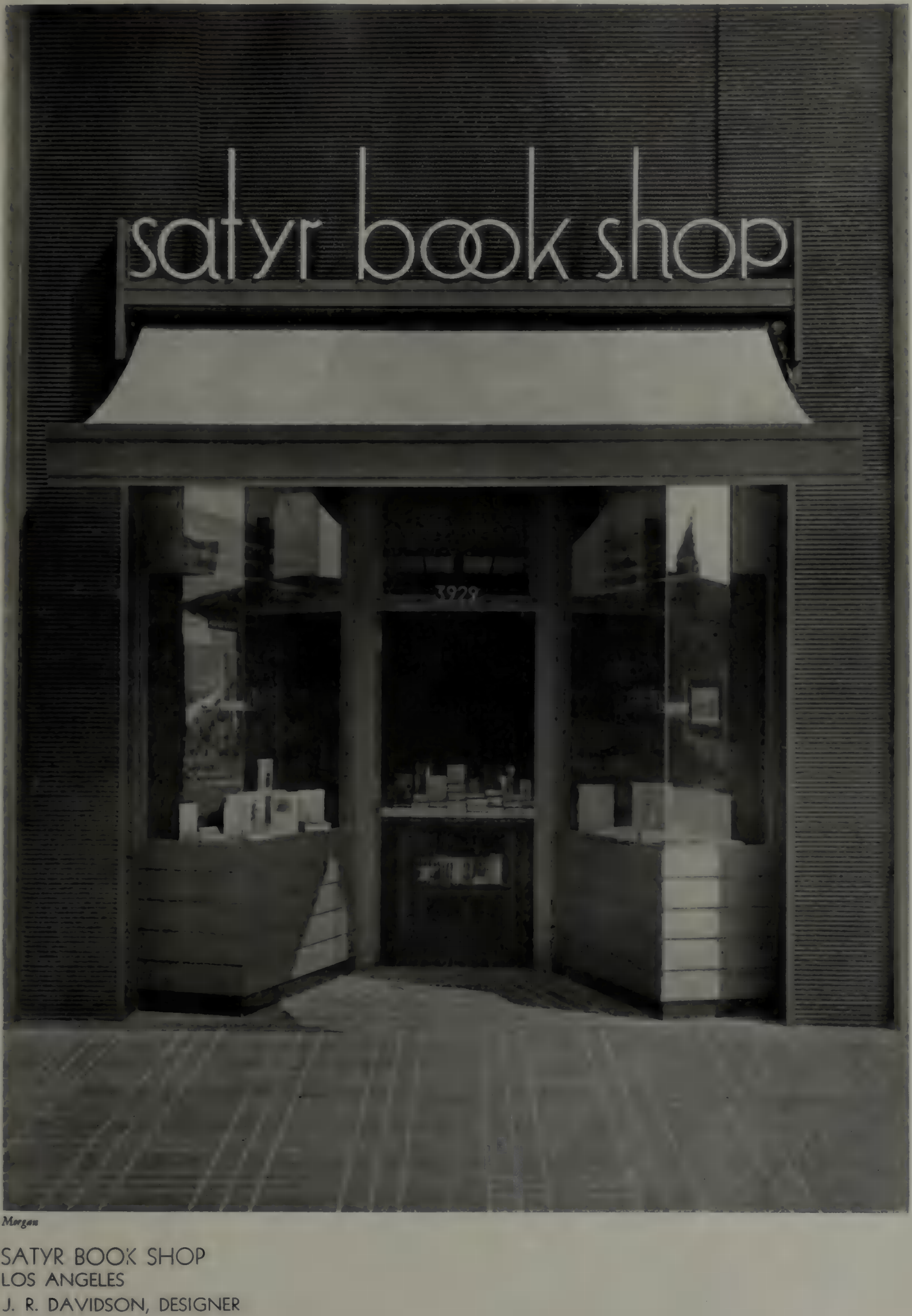
CHRYSON'S STATIONERY SHOP
LOS ANGELES
WERNER WITTKAMP, ARCHITECT

PORTFOLIO OF SHOPS AND SMALL STORES



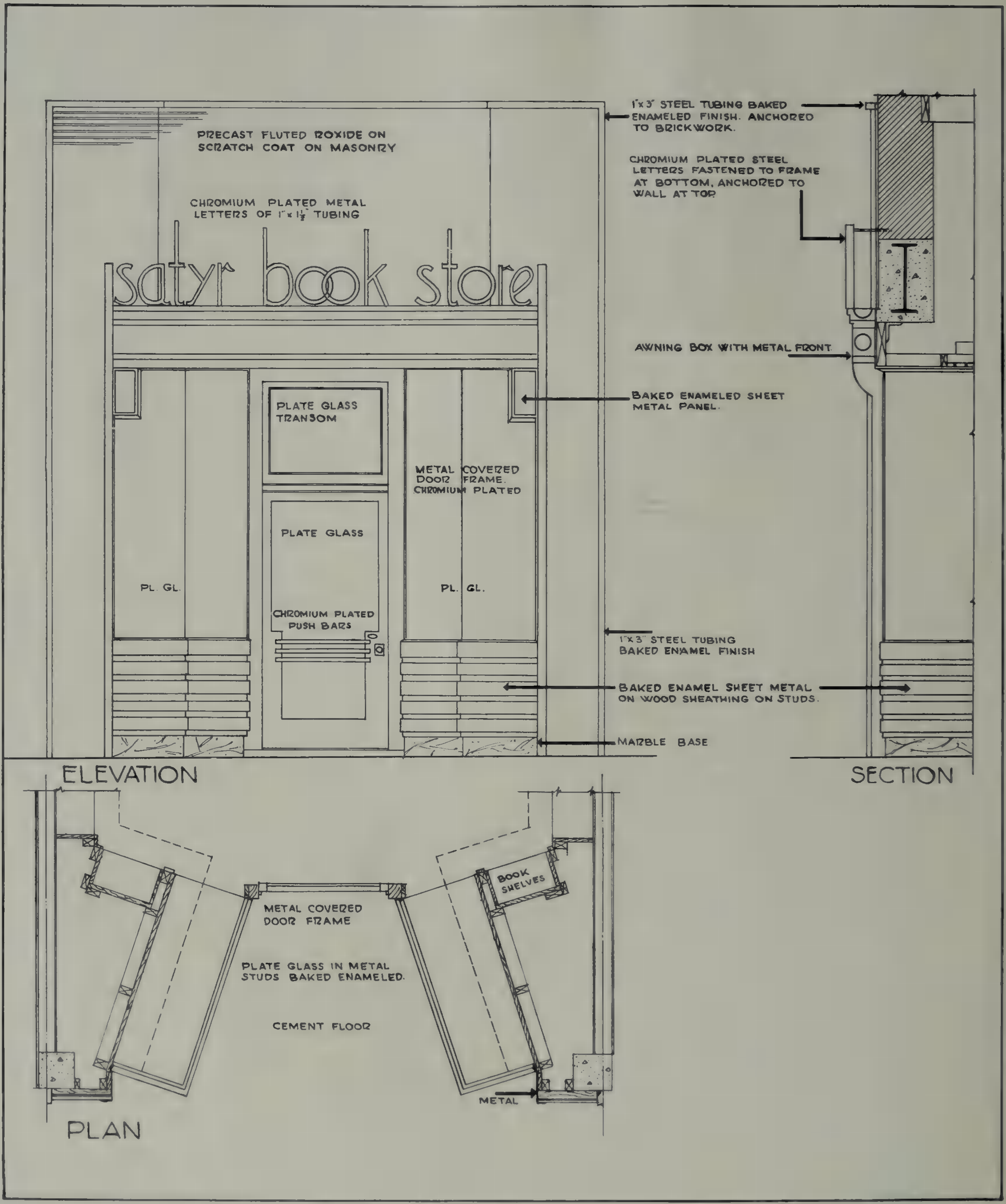
Connell

CHRYSON'S STATIONERY SHOP
LOS ANGELES
WERNER WITTKAMP, ARCHITECT

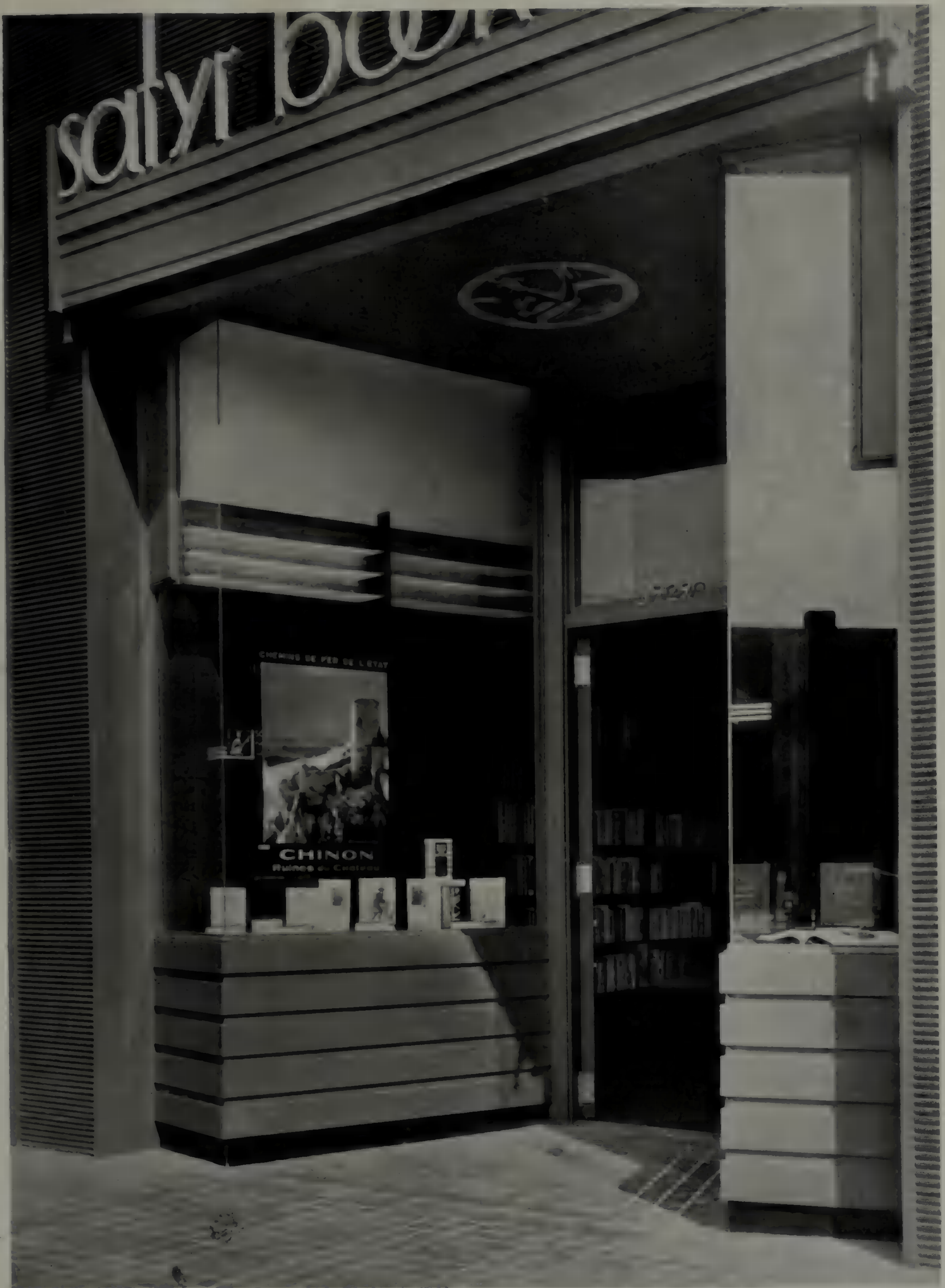


Morgan

SATYR BOOK SHOP
LOS ANGELES
J. R. DAVIDSON, DESIGNER


PRECAST FLUTED ROXIDE ON SCRATCH COAT ON MASONRY
CHROMIUM PLATED METAL LETTERS OF 1" x 1½" TUBING
satyr book store
PLATE GLASS TRANSOM
METAL COVERED DOOR FRAME. CHROMIUM PLATED
PLATE GLASS
PL. GL.
PL. GL.
CHROMIUM PLATED PUSH BARS
1" x 3" STEEL TUBING BAKED ENAMELED FINISH. ANCHORED TO BRICKWORK.
CHROMIUM PLATED STEEL LETTERS FASTENED TO FRAME AT BOTTOM, ANCHORED TO WALL AT TOP.
AWNING BOX WITH METAL FRONT
BAKED ENAMELED SHEET METAL PANEL.
1" x 3" STEEL TUBING BAKED ENAMEL FINISH
BAKED ENAMEL SHEET METAL ON WOOD SHEATHING ON STUDS.
MARBLE BASE
ELEVATION
SECTION
BOOK SHELVES
METAL COVERED DOOR FRAME
PLATE GLASS IN METAL STUDS BAKED ENAMELED.
CEMENT FLOOR
METAL
PLAN

SATYR BOOK SHOP
LOS ANGELES
J. R. DAVIDSON, DESIGNER



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SATYR BOOK SHOP
LOS ANGELES
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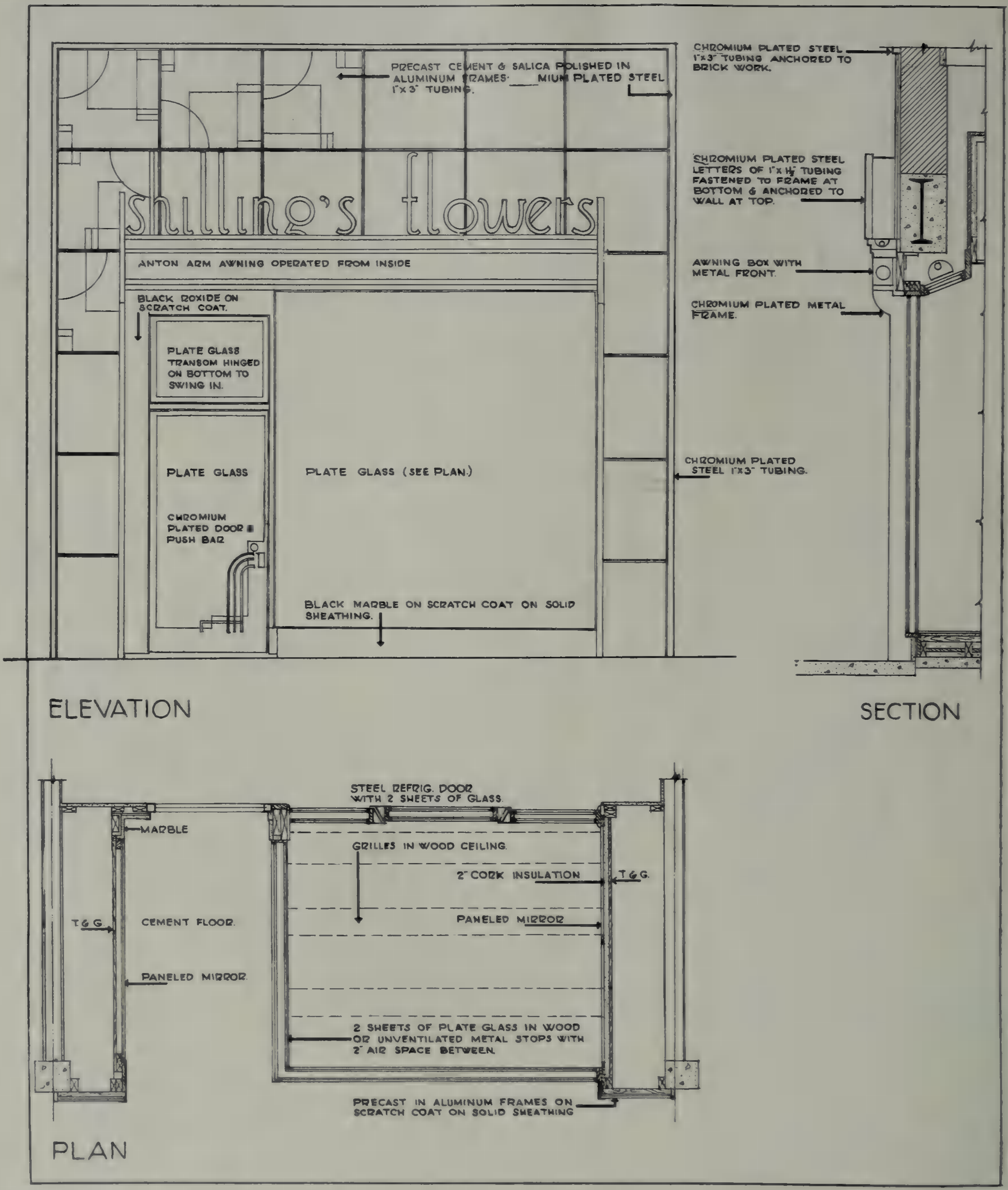
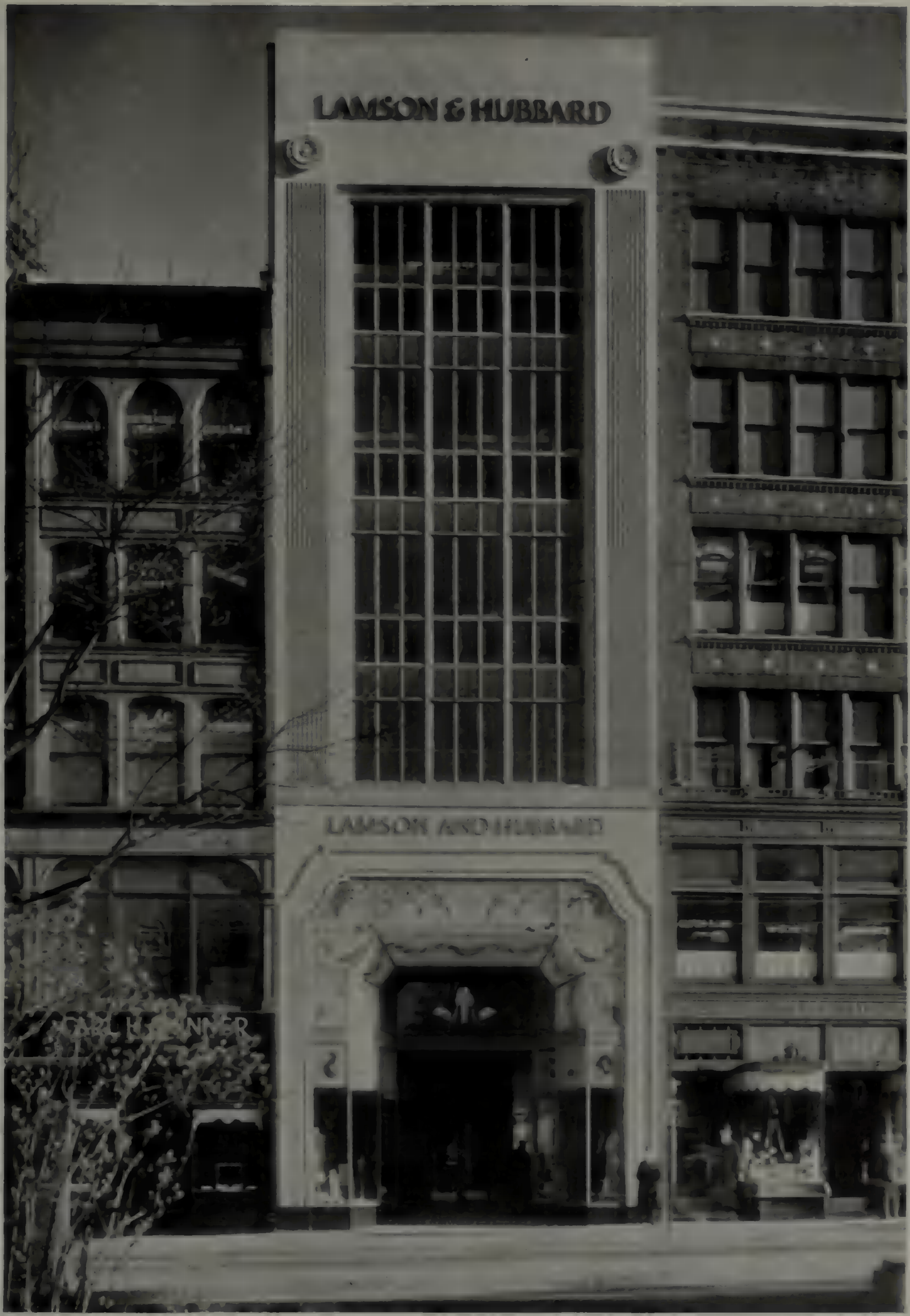

PRECAST CEMENT & SALICA POLISHED IN ALUMINUM FRAMES· MIUM PLATED STEEL 1"x3" TUBING.
shilling's flowers
ANTON ARM AWNING OPERATED FROM INSIDE
BLACK ROXIDE ON SCRATCH COAT.
PLATE GLASS TRANSOM HINGED ON BOTTOM TO SWING IN.
PLATE GLASS
CHROMIUM PLATED DOOR & PUSH BAR
PLATE GLASS (SEE PLAN.)
BLACK MARBLE ON SCRATCH COAT ON SOLID SHEATHING.
CHROMIUM PLATED STEEL 1"x3" TUBING.
ELEVATION
CHROMIUM PLATED STEEL 1"x3" TUBING ANCHORED TO BRICK WORK.
CHROMIUM PLATED STEEL LETTERS OF 1"x 1½" TUBING FASTENED TO FRAME AT BOTTOM & ANCHORED TO WALL AT TOP.
AWNING BOX WITH METAL FRONT.
CHROMIUM PLATED METAL FRAME.
SECTION
STEEL REFRIG. DOOR WITH 2 SHEETS OF GLASS.
MARBLE
GRILLES IN WOOD CEILING.
2" CORK INSULATION
T&G.
T&G.
CEMENT FLOOR.
PANELED MIRROR
PANELED MIRROR
2 SHEETS OF PLATE GLASS IN WOOD OR UNVENTILATED METAL STOPS WITH 2" AIR SPACE BETWEEN.
PRECAST IN ALUMINUM FRAMES ON SCRATCH COAT ON SOLID SHEATHING
PLAN

FLOWER SHOP
LOS ANGELES
J. R. DAVIDSON, DESIGNER

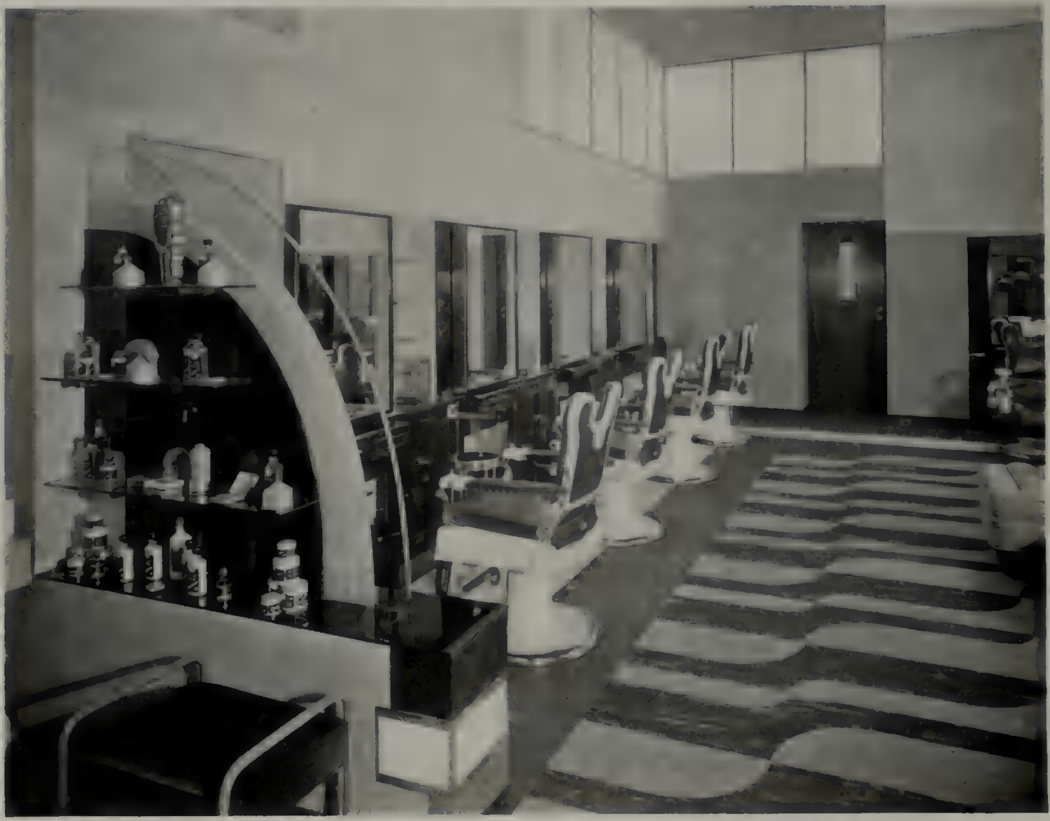


Weber

LAMSON AND HUBBARD BUILDING
BOSTON
ISIDOR RICHMOND, ARCHITECT

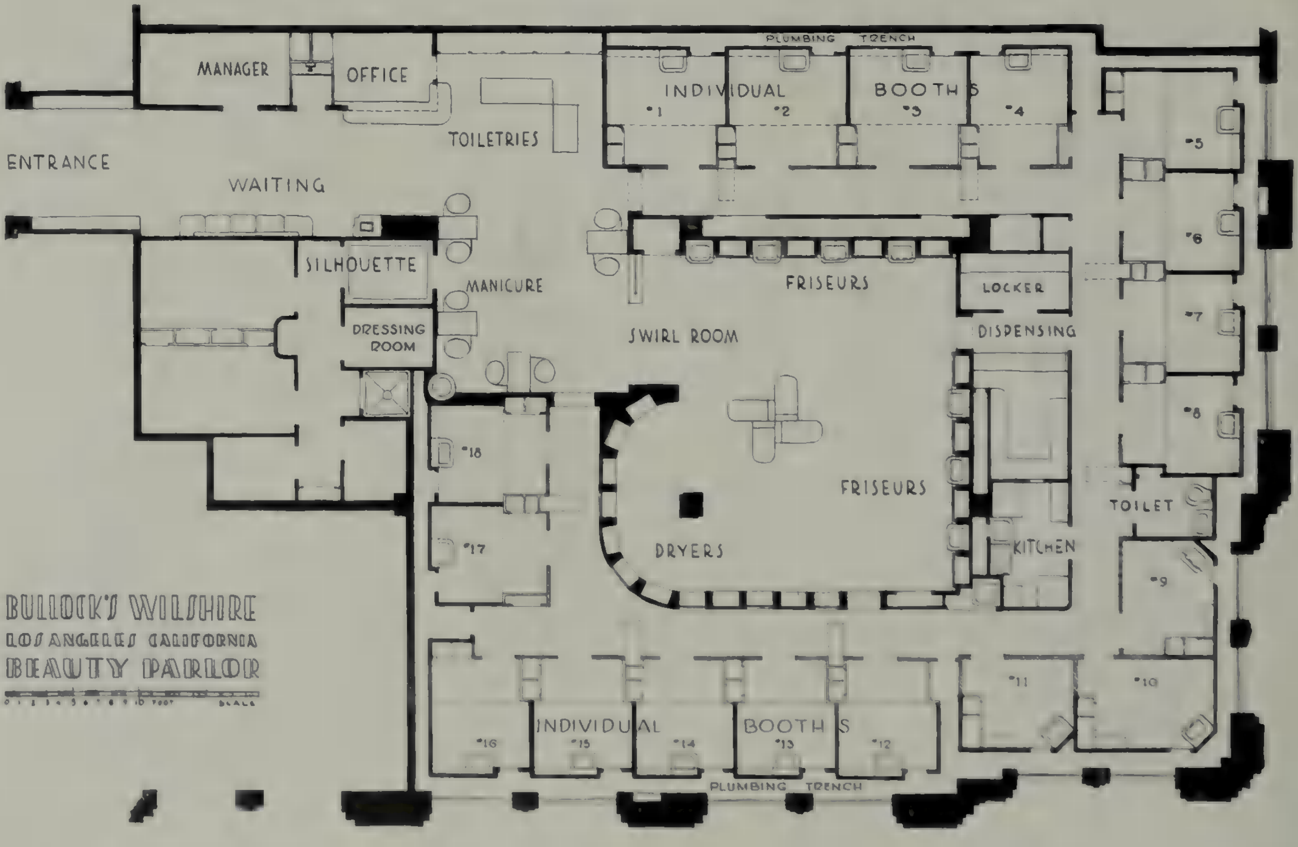
A DEPARTMENT STORE BEAUTY PARLOR

LOS ANGELES



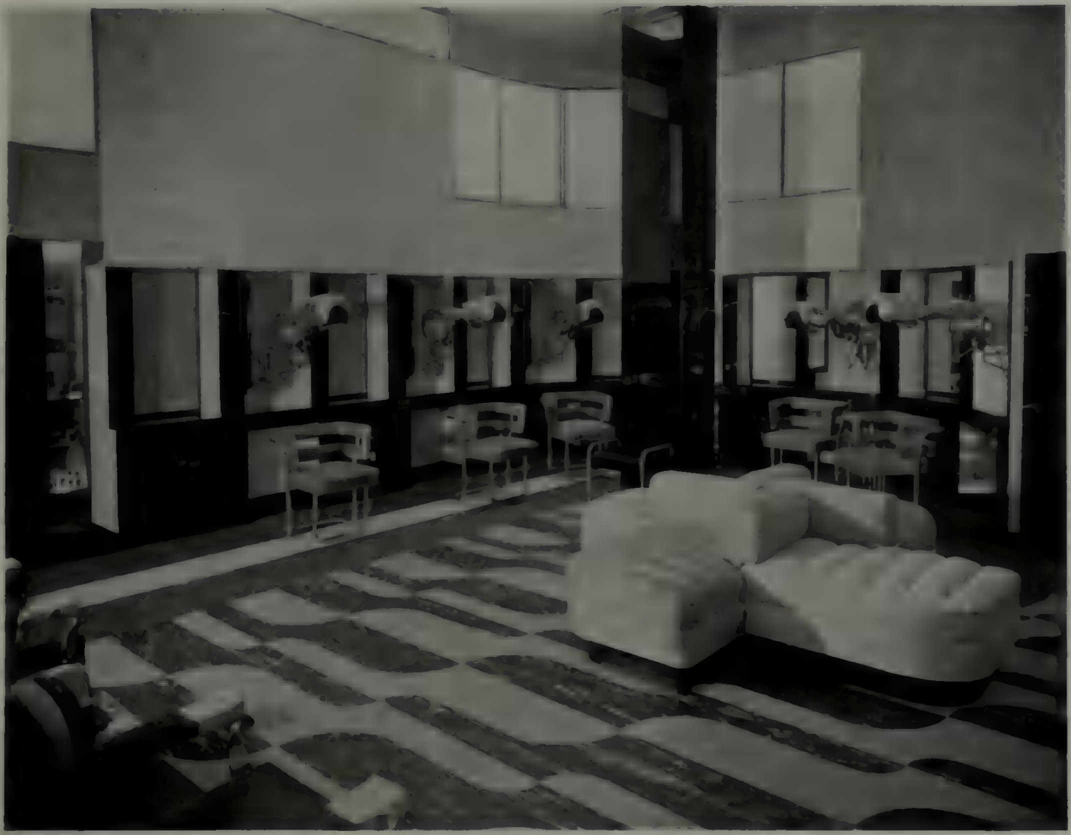
Mott Studios

Swirl room



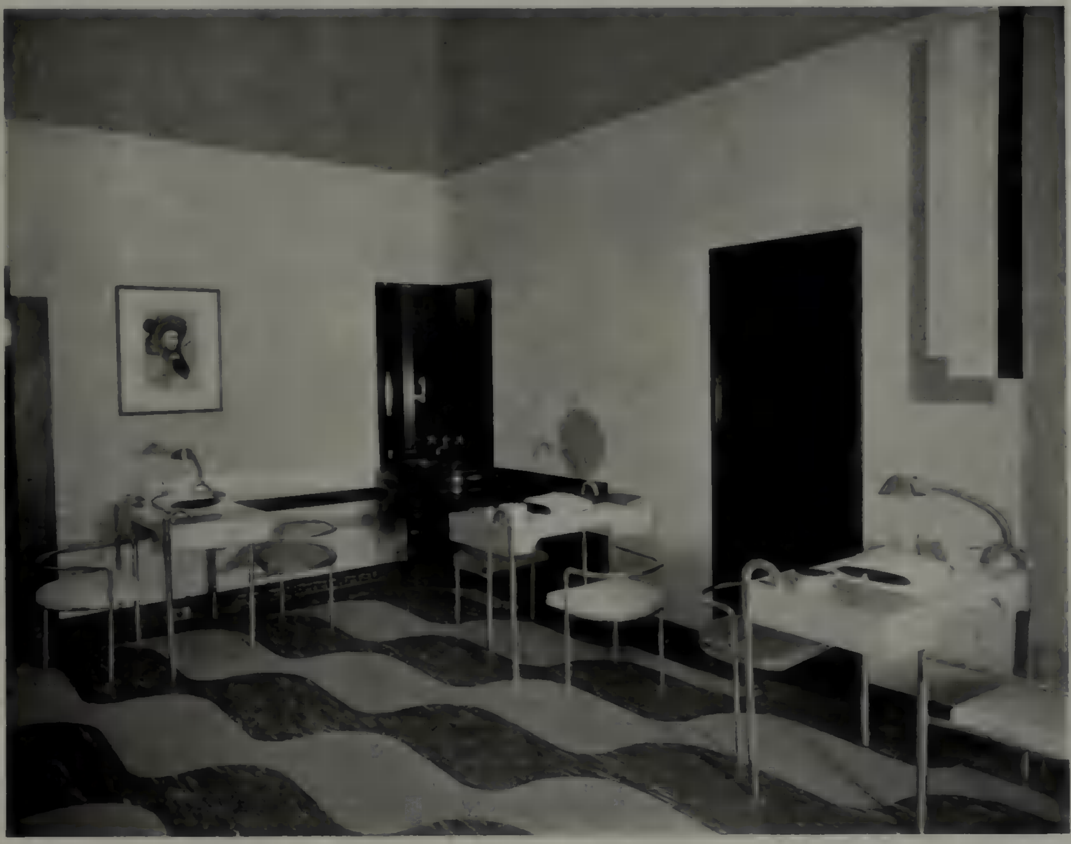
JOHN WEBER AND ELEANOR LEMAIRE, DESIGNERS

DESIGNED BY JOHN WEBER AND ELEANOR LEMAIRE



Mott Studios

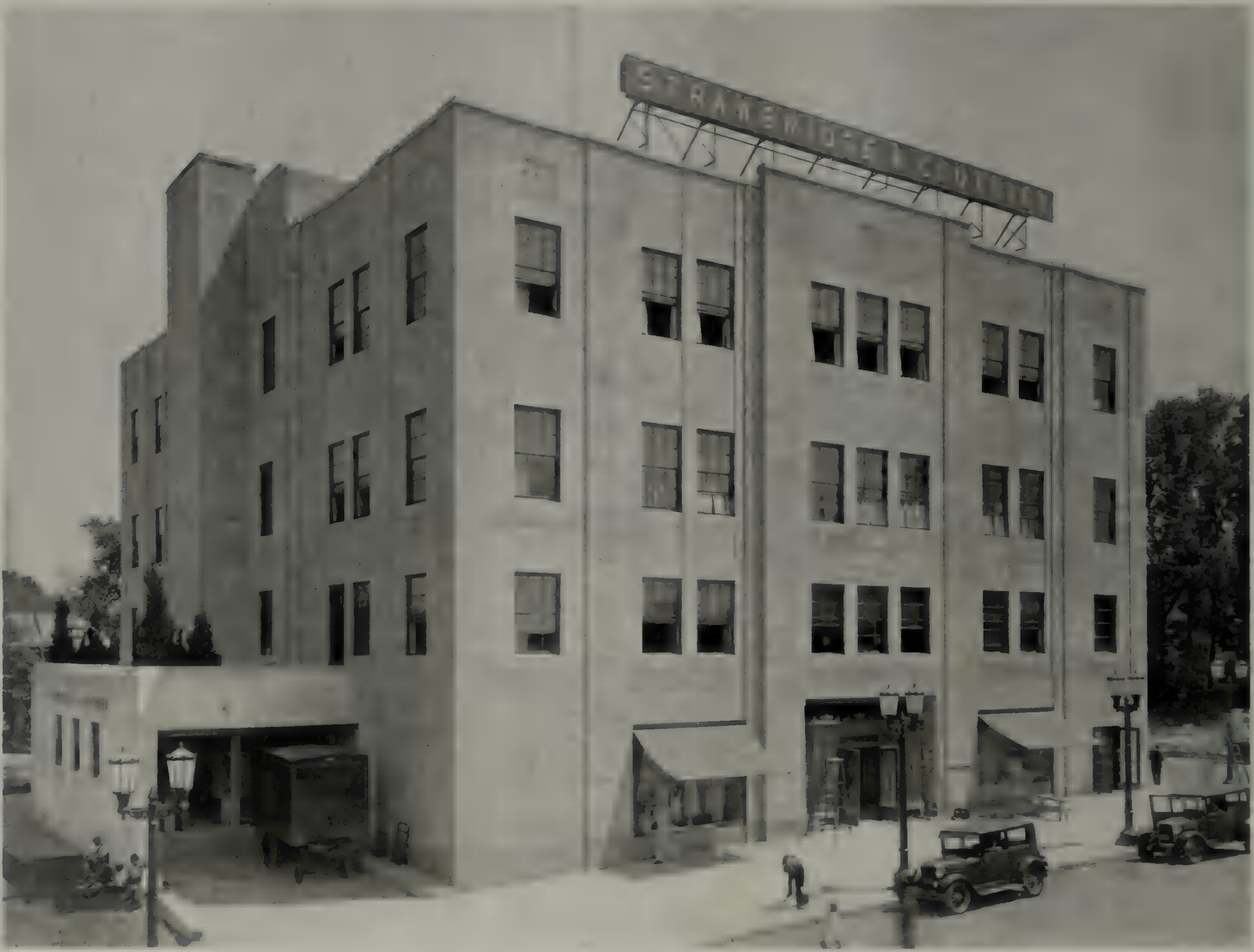
Dryers



Manicure tables

BULLOCK'S WILSHIRE BEAUTY PARLOR
LOS ANGELES

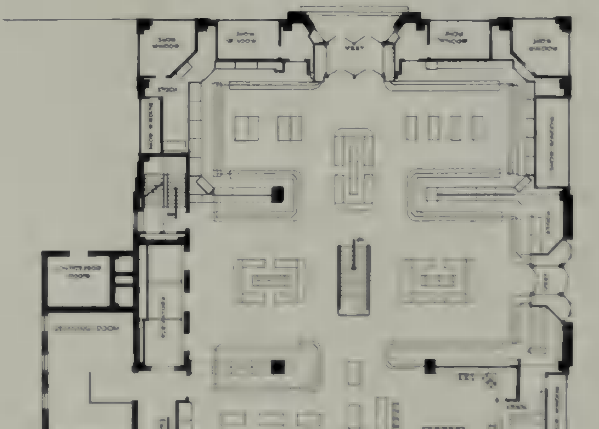
A SUBURBAN DEPARTMENT STORE



Richards

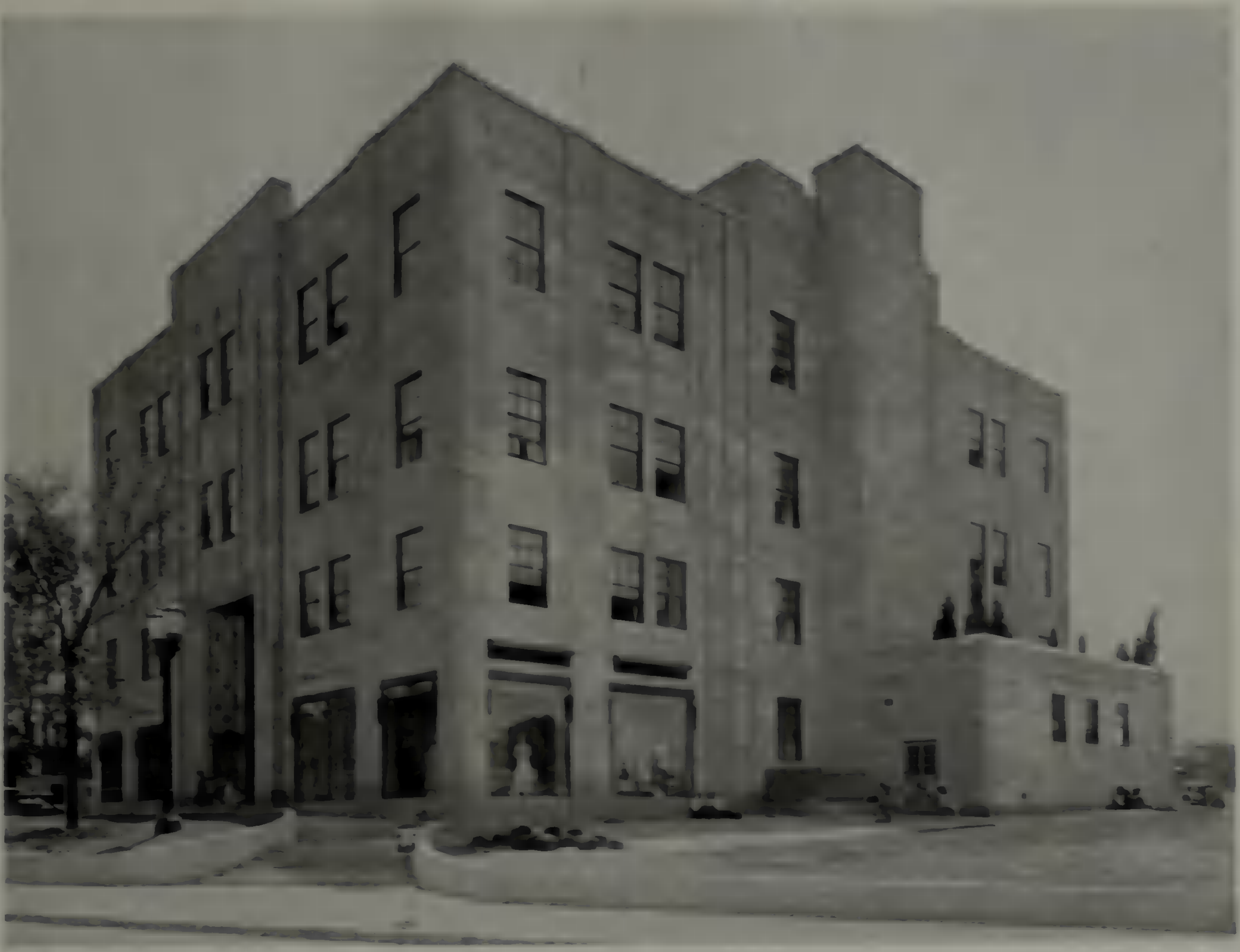
STRAWBRIDGE AND CLOTHIER DEPARTMENT STORE
BRANCH AT ARDMORE, PENNSYLVANIA

Congested streets and inadequate parking facilities in "downtown" shopping districts have caused many large department stores to open suburban branches. These have been found successful.



Ground floor plan

DREHER AND CHURCHMAN, ARCHITECTS



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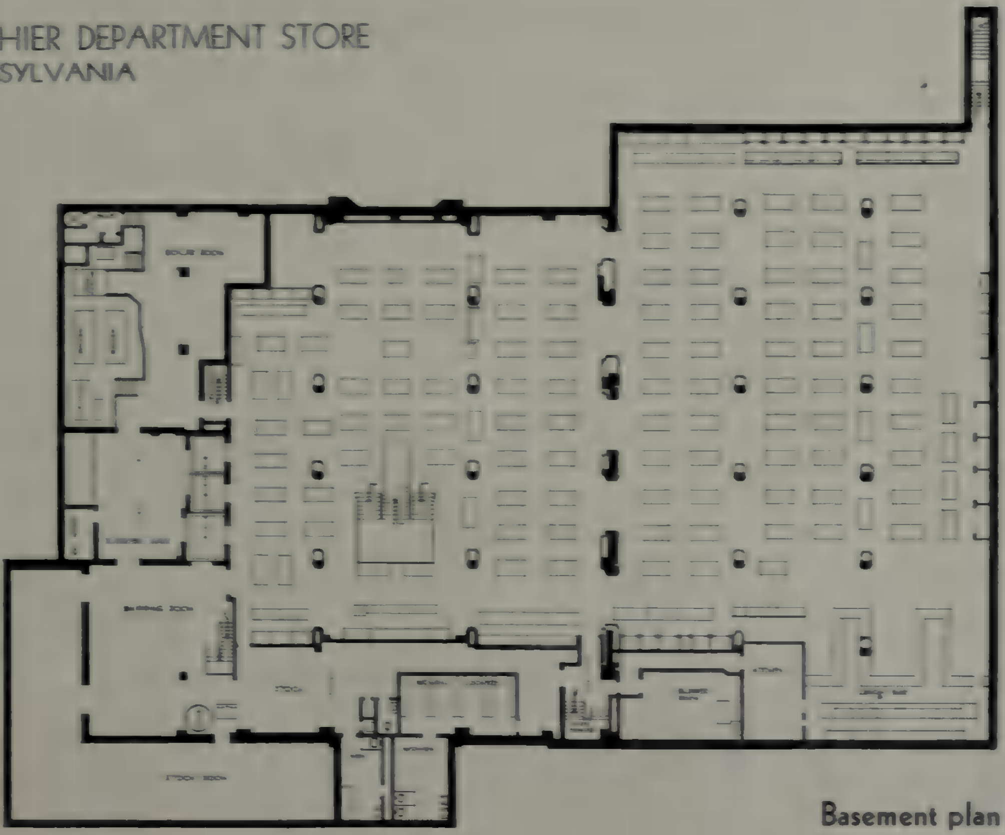
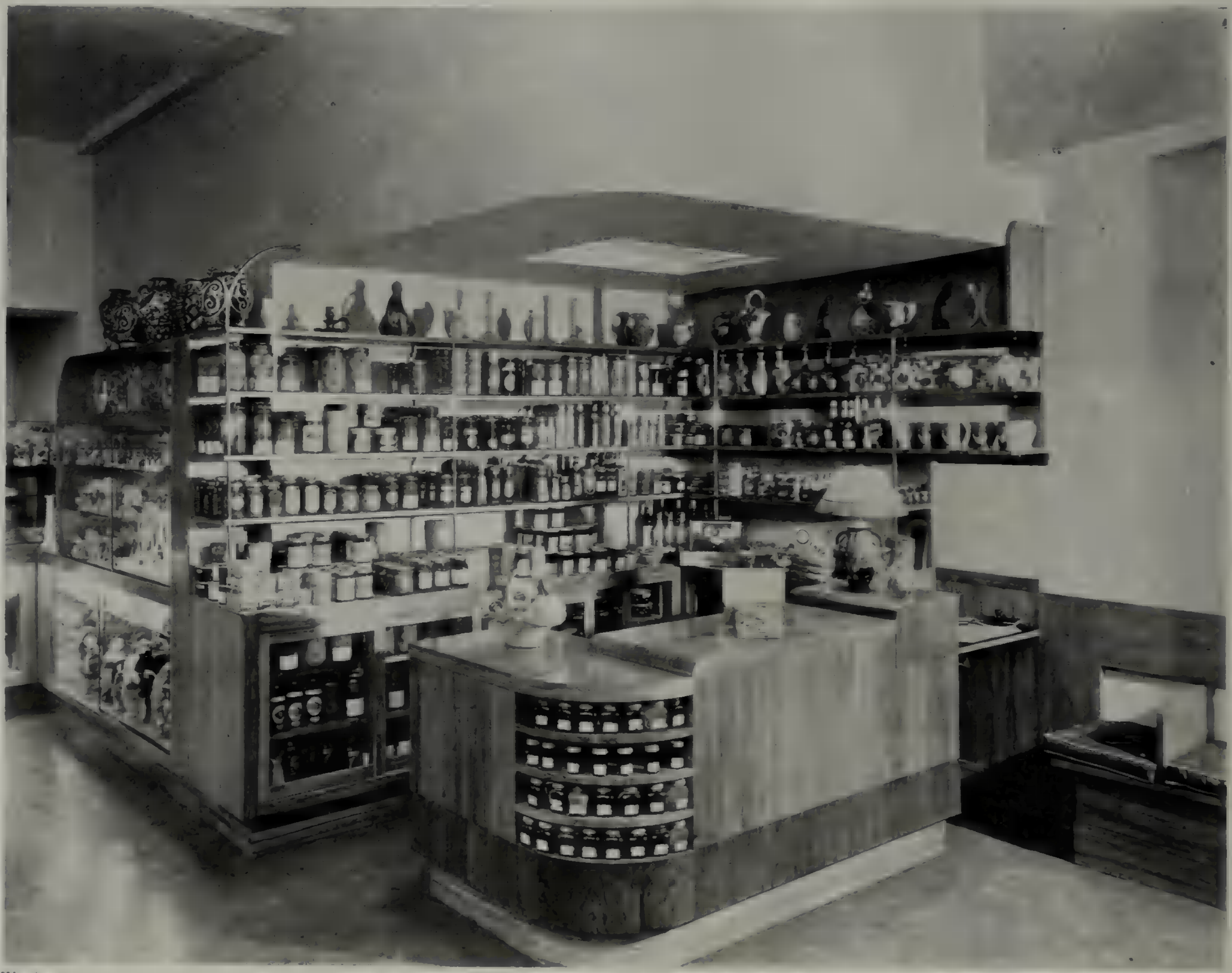
STRAWBRIDGE AND CLOTHIER DEPARTMENT STORE
BRANCH AT ARDMORE, PENNSYLVANIA



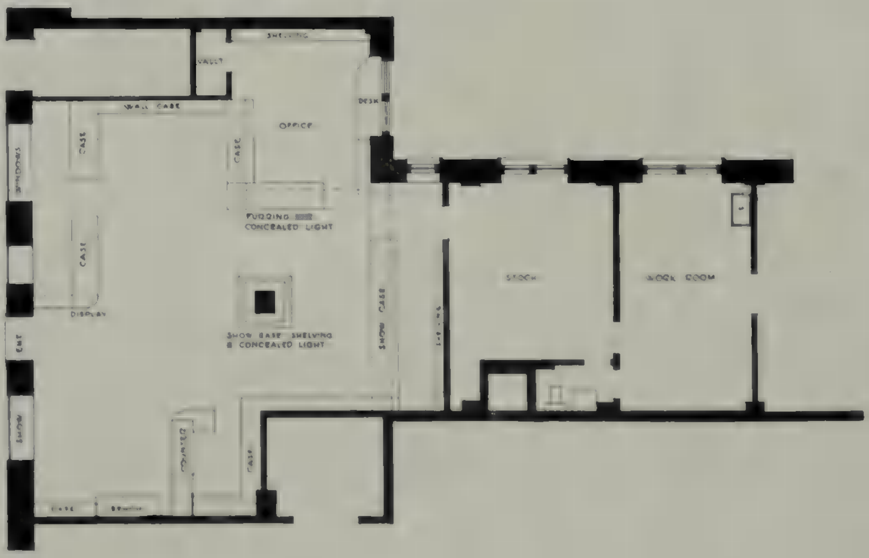
Basement plan

A CONFECTIONERY SHOP



Worsinger

EMMA BRUNS' CONFECTIONERY SHOP
NEW YORK CITY



Walls: peach.

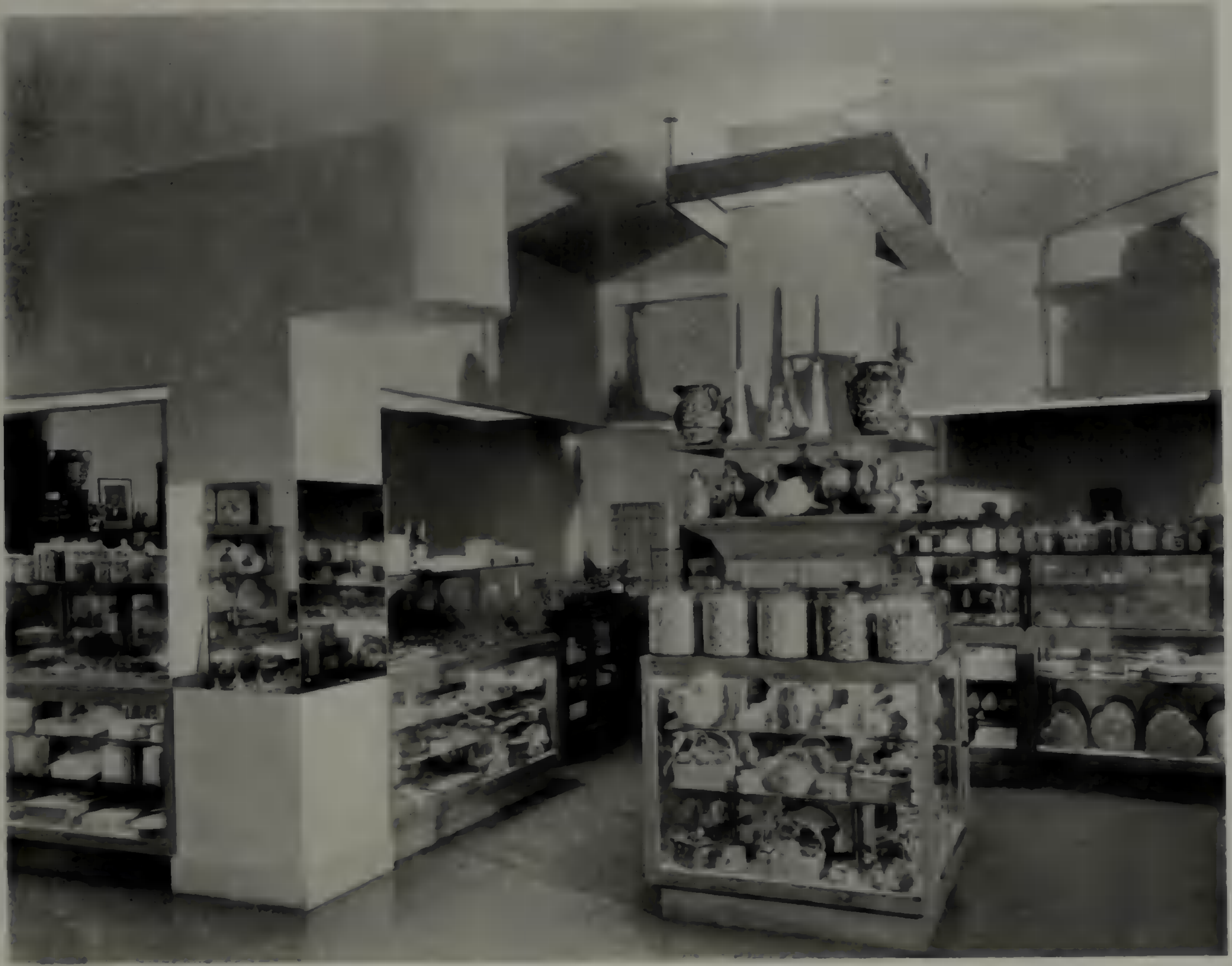
Woodwork: figured gumwood.

Counters: walnut.

Metal work: chromium-plated.

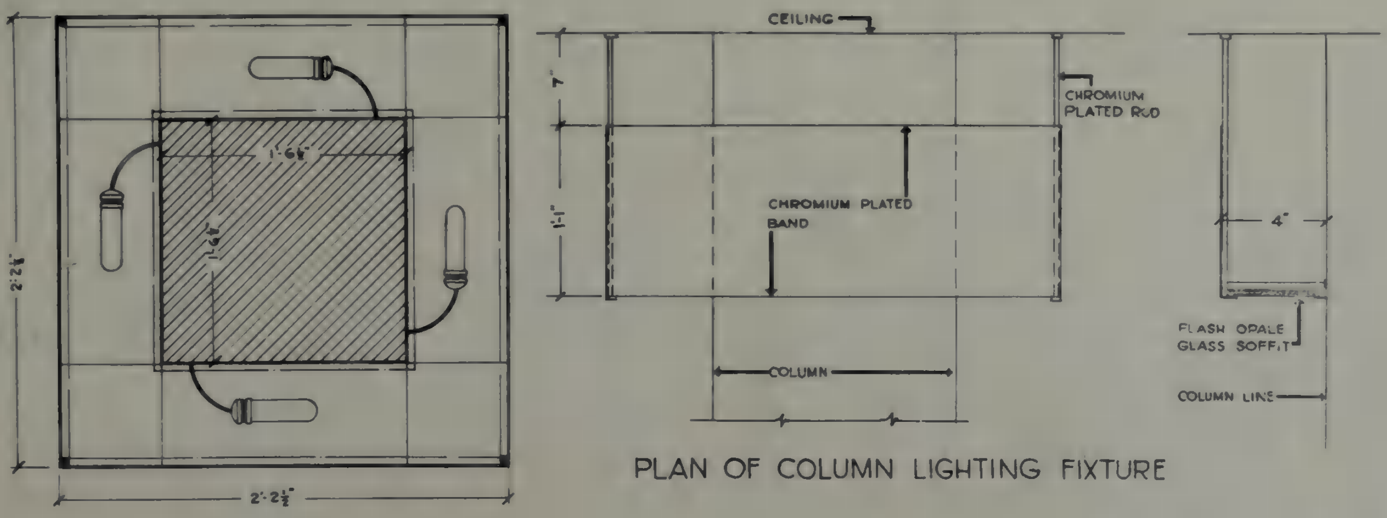
Flooring: linoleum (terra cotta color).

JO BRANDES, DESIGNER

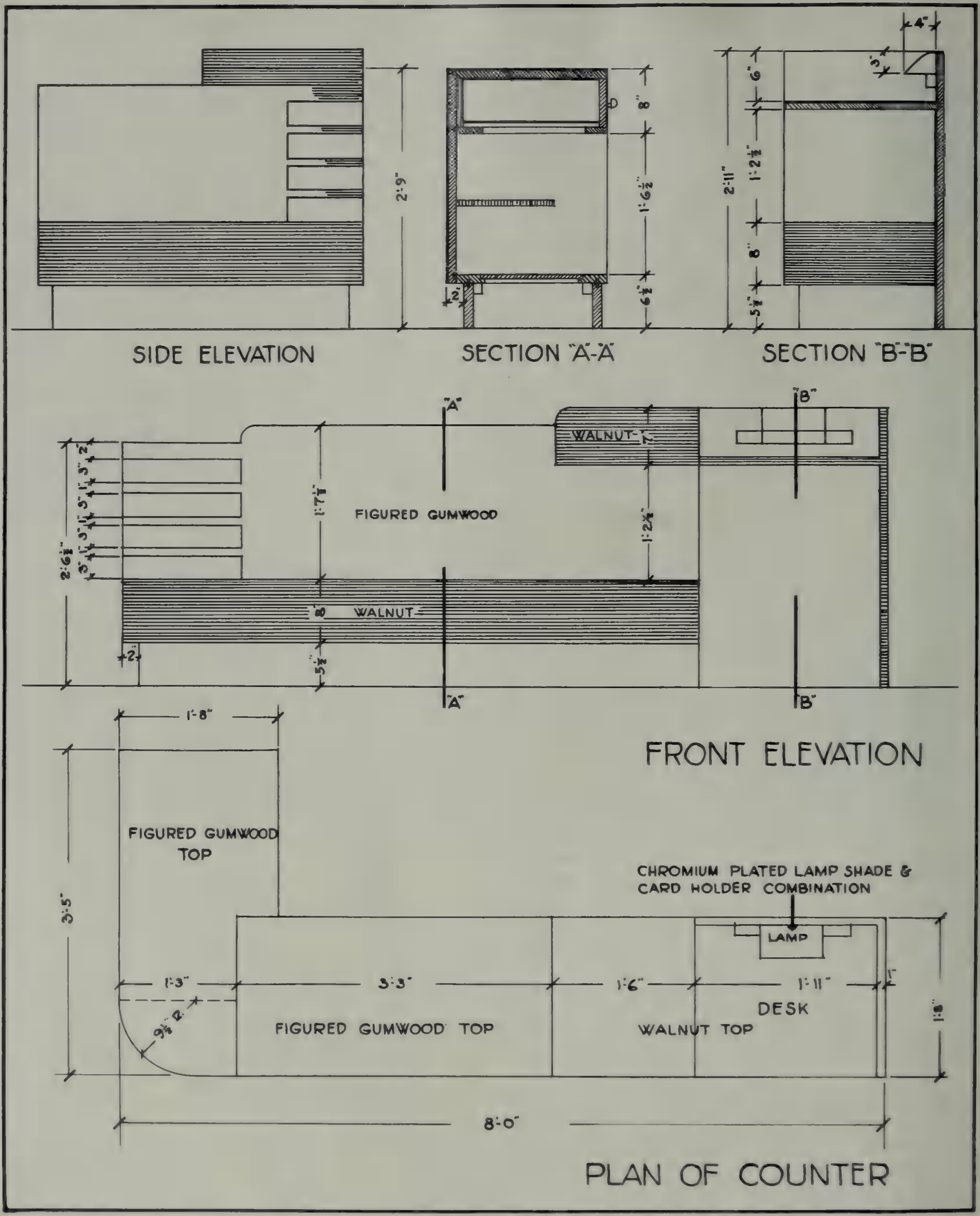


Worsinger

EMMA BRUNS' CONFECTIONERY SHOP
NEW YORK CITY



PLAN OF COLUMN LIGHTING FIXTURE



EMMA BRUNS' CONFECTIONERY SHOP
NEW YORK CITY
JO BRANDES, DESIGNER

CONSTRUCTION COSTS

The nearest approach to a percentage in materials cost reduction is found in cases where bids were refigured from plans drawn last year. On this basis costs appear to be approximately 13 per cent below those of 1929. The National Lumber Manufacturers Association shows a decline of 13 per cent on single family residence construction in the Middle-West. These figures are based upon a guaranteed bid in August 1930 as compared with the actual construction of a house built from the same plans in 1929. The reduction is divided as follows:

Excavating	35%	Plumbing, heating	2%
Masonry	12%	Painting	16%
Millwork	20%	Finish hardware	35%
Lumber	14%	Wiring	10%
Carpenter labor	10%	Tile	24%
Plastering	3%	Electric fixtures	25%

On larger work the Austin Company, engineers and builders of Cleveland, Ohio, state that building costs are 15 to 20 per cent below the average of the past 10 years. Also the United States Treasury Department, which has charge of constructing post offices and other federal buildings, states that the decline east of the Mississippi amounts to 15 per cent based upon a comparison of bids in 1929 and 1930 for identical buildings.

The important point is, have prices reached the bottom or will they go still lower? In this connection we quote the following statement from Col. John C. Hegeman, President of the Hegeman-Harris Co., Inc.: "We are undoubtedly in a 'buyers' market' in the building business. This condition runs all through the industry, including manufacturers of the numerous items which are required in construction.

"Costs have been in a definite downward trend for more than a year and in the opinion of many builders of the United States this price trend has reached a point where stabilization at existing levels is at hand. Wage scales are fixed and no one desires a downward revision. Productive efficiency, however, has increased in a marked degree. Material costs have undergone a decided drop in all departments and, we believe, have reached a point where further reductions will be small.

"In the light of these facts it would seem good business judgment for institutions, corporations, and other large investors in building construction to take advantage of this 'buyers' market' and proceed with construction programs which have been deferred because of price uncertainties incident to such a market."

Although the price of 1.60 Pittsburgh has been definitely accepted as the prevailing price for steel shapes and plates, there is a decided tendency towards stabilization at the present prices. The action of the Carnegie Steel Company in announcing the present prices as a minimum is considered by the trade as a decided stand for that purpose and will, no doubt, be so interpreted by other steel producers.

Other factors pointing toward stabilization at present prices are the large purchases by the American Radiator Company of 50,000 tons of pig iron and the abrupt upturn in the price of copper. Although the smallest percentage of capacity is being utilized at present, there has been a large amount of business in sight from railroads and public works construction, all of which is expected by fabricating shops to put an end to the present price-cutting era.

The lumber situation is somewhat different than that of steel, due, no doubt, to the greater number of producers and the lack of cohesion among them. The last figures obtainable showed that for 616 softwood mills the total production was 222 million feet, shipments were 238 million, and new orders amounted to 211 million. The market is considerably weakened and prices reflected this weakness. The hope for improvement lies in improved foreign shipments and an unexpected improvement in residential construction.

PETER A. STONE

Westinghouse Lamp Co.

UNDERWATER LIGHTING FOR SWIMMING POOLS

Swimming pool illumination should come from a maximum number of small units spaced uniformly around the pool but in general not installed in the shallow end excepting where the pool is very wide. It is the conclusion of Mr. E. W. Beggs, illuminating engineer for the Westinghouse Lamp Company, that all units should be located about the same distance below the water level and that this distance, in general, should be approximately 2½ feet to the center of the unit in order to bring it below those points on the wall against which swimmers and water polo players will push off. It is also concluded that the major amount of the light should come from the units mounted along the two side walls but that light should also be thrown into the pool from units mounted in the deep end wall, particularly to illuminate for diving. All units should in general be equipped with lenses which will spread the light beam out into a wide horizontal fan. The units in the deep end should be equipped with lenses arranged to direct part of the light downward.

Sketches show the common type of installation, which is called the niche mounting, with which the water seal of the pool wall is unbroken. Such a device is most effective at least as far as economy of installation is concerned where the pool walls are not free standing as would be the case with the average outdoor pool.

This Aqualux unit can also be installed in several ways in pools already built. The most successful is that used in a private pool on the Randolph-Jacobs Estate, Armonk, N. Y.

In an article that appeared in *Electrical Installation Record*, September, 1930 (pages 33-35), Mr. Beggs points out that this new method of pool lighting has safety and hygienic advantages. "Swimmers are always in distinct view of lifeguards and any mishaps are instantly seen. Light rays shooting through the water show any material in suspension as an indication of improper filter performance and clean water is thus maintained.

"The diagram illustrates the lighting of a 'standard indoor pool.' The minimum lighting load is equal to twice the water surface area in square feet, which is 1875 x 2, or 3750 watts. At least 16 250-watt units are required. In a standard pool of this kind, with the length three times the width, about 25% to 30% of the light should come from the deep end units. Four units at the 2½ foot depth are mounted there as shown, to provide this light. One unit is added for a total of 16 to balance the load and give an even number on each side. The remaining units are distributed equally and directly opposite one another along the side walls, 12′ 6″ apart at this same depth. No units are located at the shallow end except where width is 100 feet or more. To eliminate dark corners, the first unit is mounted 6′ 4″ from the deep end wall.

"Each fixture should be placed in a cast bronze box molded in the pool wall or, where economy is vital, separate wall niches formed in the concrete may be used. To relamp or otherwise service the unit, it is only necessary to draw it out of the niche (see diagram), and above the water. A length of flexible waterproof cable is attached to each unit and stowed in a flush bronze floor box, located in the walk above water. As the unit is taken out this cord feeds down through the ¾″ brass pipe and, conversely, when the fixture is replaced, the excess cable is drawn up and coiled away. The position of the unit on the walk ready for servicing is shown in the diagram.

"Underwater lighting in outdoor pools is carried out in the same manner. Submerged units in the walls project their luminous flux through the water. Pools of ordinary size, less than 75 feet wide, use small units because they distribute light evenly. Larger pools frequently install the small units using 250-watt lamps, but the greater number required may make the cost prohibitive. If this is true, it is more economical to use large Aqualux units of 500- or 1000-watt size. These are especially recommended for pools of 10,000 sq. ft. area or more. The 250-watt Aqualux unit is described in accompanying illustrations and diagrams.

"A simple and effective system of wiring and control for underwater lighting is shown by the accompanying diagrams. The three-wire installation provides separate control of alternate units so that

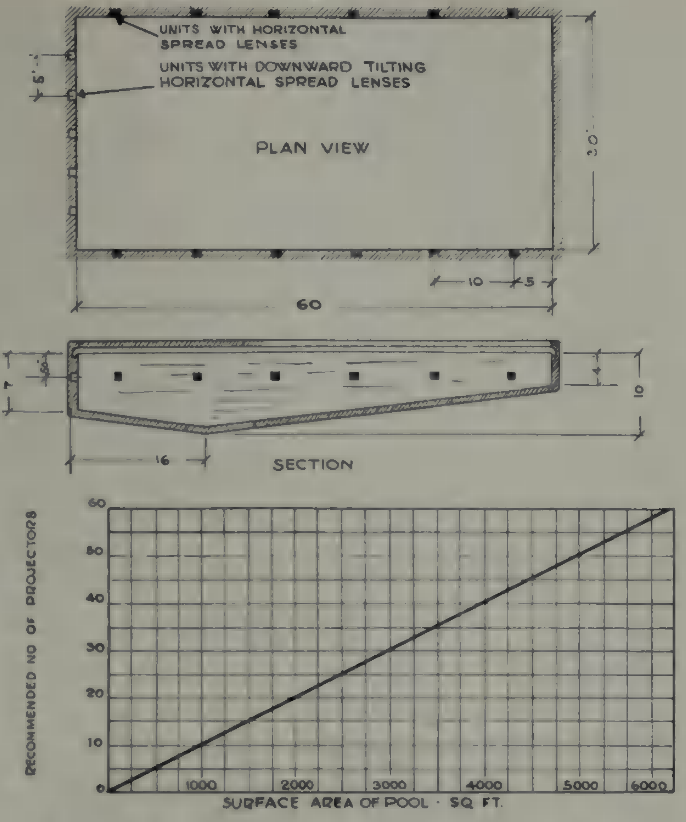
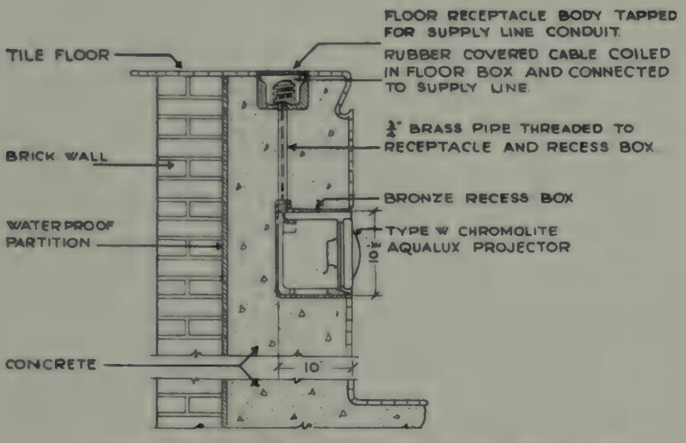
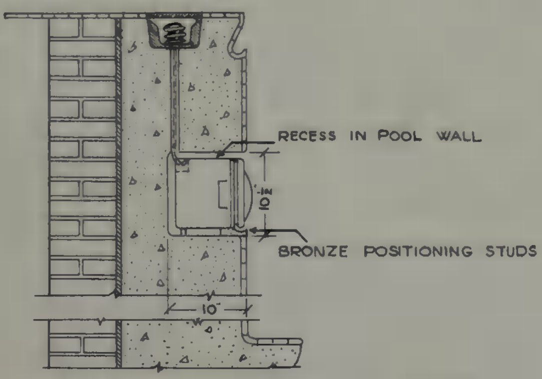

UNITS WITH HORIZONTAL SPREAD LENSES
UNITS WITH DOWNWARD TILTING HORIZONTAL SPREAD LENSES
PLAN VIEW
5'
30'
10
5
60
7
4
10
16
SECTION
RECOMMENDED NO OF PROJECTORS
0
10
20
30
40
50
60
1000
2000
3000
4000
5000
6000
SURFACE AREA OF POOL · SQ FT.

DIAGRAM OF LIGHTING FOR STANDARD POOLS

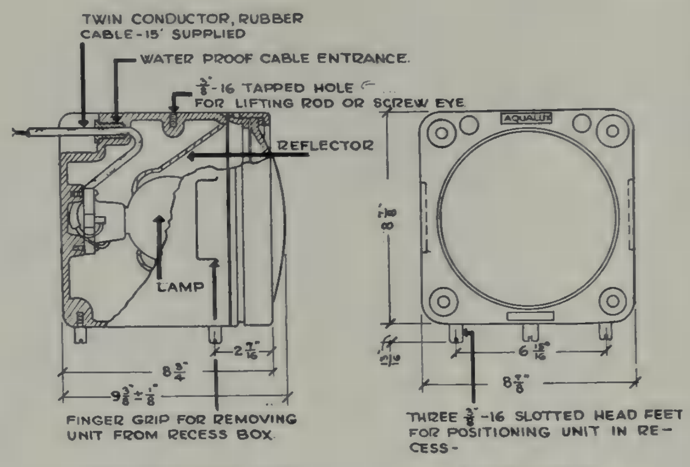

FLOOR RECEPTACLE BODY TAPPED FOR SUPPLY LINE CONDUIT.
TILE FLOOR
RUBBER COVERED CABLE COILED IN FLOOR BOX AND CONNECTED TO SUPPLY LINE.
¾" BRASS PIPE THREADED TO RECEPTACLE AND RECESS BOX.
BRICK WALL
BRONZE RECESS BOX
WATERPROOF PARTITION
TYPE W CHROMOLITE AQUALUX PROJECTOR
10½"
CONCRETE
10"

INSTALLATION WITH RECESS BOX - SIDE VIEW



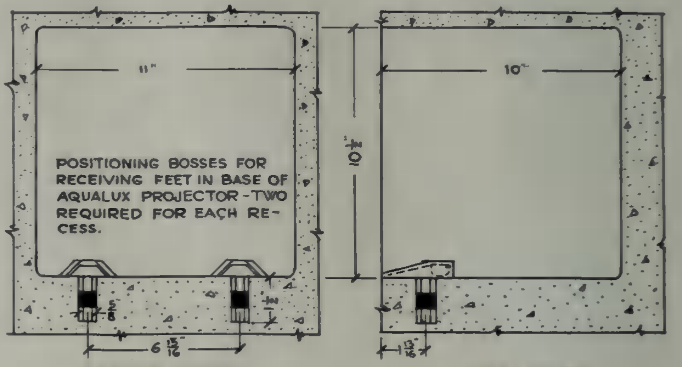
INSTALLATION WITH POSITIONING STUDS
SIDE VIEW

DETAIL OF LIGHTING FIXTURE


TWIN CONDUCTOR, RUBBER CABLE-15' SUPPLIED
WATER PROOF CABLE ENTRANCE.
$\frac{3}{8}$"-16 TAPPED HOLE FOR LIFTING ROD OR SCREW EYE.
REFLECTOR
LAMP
AQUALUX
$2\frac{7}{16}$"
$8\frac{3}{4}$"
$9\frac{3}{8}$" ± $\frac{1}{8}$"
$6\frac{15}{16}$"
$8\frac{7}{8}$"
FINGER GRIP FOR REMOVING UNIT FROM RECESS BOX.
THREE $\frac{3}{8}$"-16 SLOTTED HEAD FEET FOR POSITIONING UNIT IN RECESS-

SIDE SECTION VIEW FRONT VIEW

TYPE W AQUALUX PROJECTOR


11"
10"
$10\frac{1}{2}$"
POSITIONING BOSSES FOR RECEIVING FEET IN BASE OF AQUALUX PROJECTOR-TWO REQUIRED FOR EACH RECESS.
$\frac{5}{8}$
$6\frac{13}{16}$"
$1\frac{13}{16}$"

FRONT VIEW SIDE VIEW

BRONZE RECESS BOX
TO BE BUILT INTO WALL OF SWIMMING POOL

novel and attractive lighting effects may be produced, with colored lenses to illuminate the water for special occasions. The lenses are 8⅜" standard size and can be supplied from the stock of local dealers.

"The area adjacent to a private outdoor pool must be lighted in a manner in keeping with its character. A private installation is generally located where there are few bright lights and where artistic quality is required in the exterior as well as in the pool lighting itself. Light emanating from underwater lighting is only sufficient to illuminate the area within a few feet of the pool. Therefore, floodlighting of shrubbery, trees, walls, etc., within 50 feet or so of the pool, is ideal. The illustration shows this use of indirect illumination for the beautification of adjacent areas. Ornamental lanterns of street lighting type with low-powered lamps mounted on small artistic posts also produce a desirable effect. For outdoor pools special illumination may be needed for diving boards, special swimming apparatus and floats. Floodlights can be arranged to direct their beams to such points, so as to follow the observer's line of vision and give him greatest visibility.

"Public outdoor pools require high levels of illumination around the pool. Ordinary industrial type reflectors mounted 15 to 20 feet above the walk on standards spaced about 20 feet apart may be used. A more refined installation consists of powerful street lighting lamps with refracting glassware directing the light downward to the useful plane. They are mounted 25 to 35 feet high to avoid glare. With industrial reflectors or high-powered street lamps about 10 to 20 watts per running foot of walkway are necessary; or with units spaced 20 feet apart 300-watt lamps are ordinarily required.

"If floodlighting is used, the fixtures should be mounted quite high above the pool level. They should be designed and arranged to sweep the whole area, including the pool itself. However, the greatest intensities from these sources should be directed over the areas adjacent to the pool and onto diving platforms and special apparatus in the water. About two watts should be provided per square foot of area lighted, exclusive of the pool area. For very large installations floodlighting is the simplest and most effective means available for general illumination above the water surface.

"It is scarcely necessary to recommend that in order to enjoy the beauty of underwater lighting there must be no strong surface illumination, particularly since such will result in annoying water reflections, if not very carefully placed and also screened. The clarity of the water is a paramount necessity. Even slight turbidity is fatal to the success of submerged lighting, and the white tile or similar pool lining is almost equally important."

RECENT TECHNICAL DEVELOPMENTS

REDUCING DEAD LOAD SAVING TIME AND INCREASING CONTROL

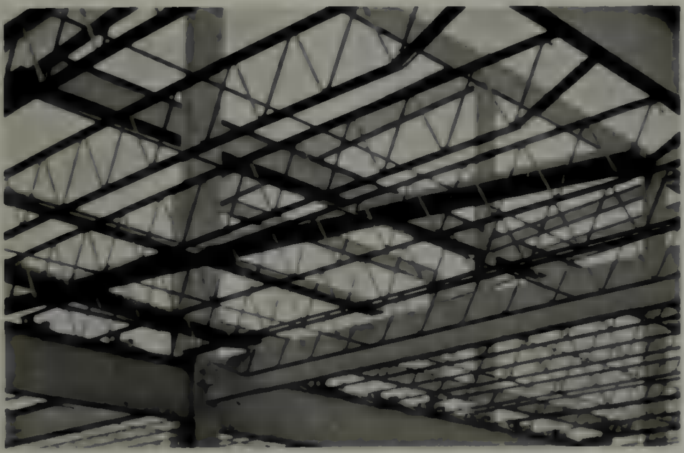


FIG. 1
TRUSCON WELDED JOISTS

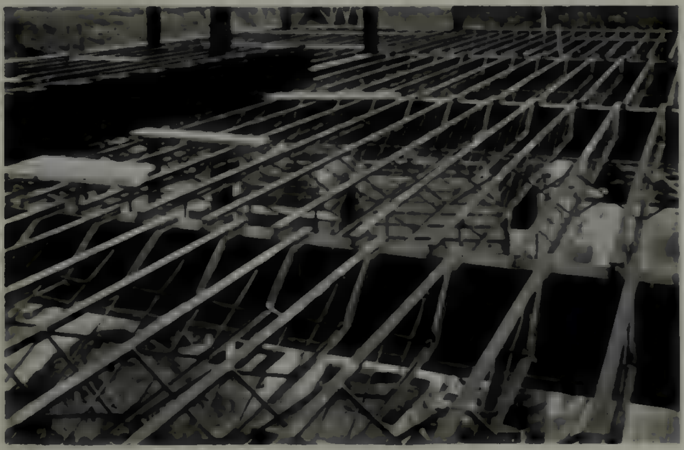


FIG. 1
KALMAN ONE-PIECE EXPANDED JOISTS

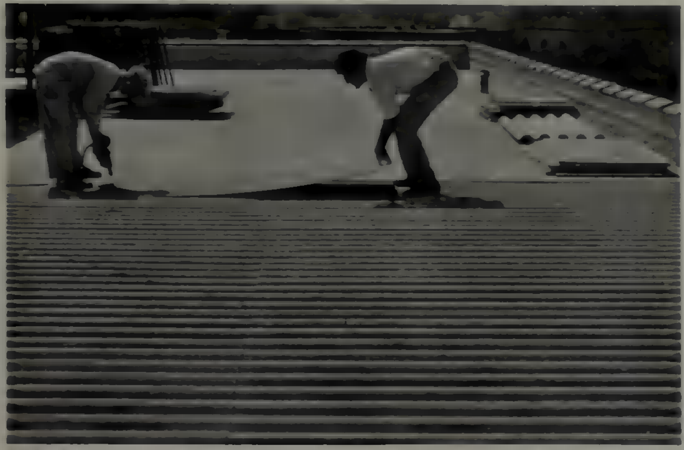


FIG. 3
ENDURO ROOF CONSTRUCTION

LIGHTWEIGHT ROOF AND FLOOR CONSTRUCTIONS

OPEN WEB STEEL JOISTS

Light-weight steel trusses designed for use in light occupancy buildings to support floor and roof panels between main supporting beams, girders, trusses or walls. Made in standard depths from 8″ to 16″ and in lengths to accommodate all spans up to 32′–0″. Spacing of joists from 12″ to 30″. Bridging with struts, wire, rods. The underslung design of the bearing insures low floor height.

Advantages

Standardized lengths, depths and carrying capacities insure easy and accurate design. Complete shop fabrication. Low weight. Reduced field work. Unskilled labor. No shoring. Ready concealment of pipes and electric circuits within depth of floor.

WELDED JOISTS

Truscon Steel Company

(Fig. 1)

Top and bottom chords of wide T-shaped members. The bottom T continues to the bearing, where it is welded with the web plate and the top chord to form a solid I-beam. Web members continuous from end to end for transmission of stresses. Electric welding.

ONE-PIECE EXPANDED JOISTS

Kalman Steel Company

(Fig. 2)

Joists produced from small I-beams by slitting the webs and drawing the flanges apart to the required depth of the truss. The result is a double lattice truss in which the chords and the web members are of one piece. The bottom chords are bent up at the ends providing a 2½″ depth at the bearing.

ENDURO

R. A. Laidlaw, patentee, San Antonio, Texas

(Fig. 3)

Corrugated asbestos cement sheets (*Transite*) carry the loads between the supports. Flat sheets of the same material fastened on top of the corrugated sheets with wood screws provide a flat surface for finished treatment. The corrugated sheets are screwed directly to the supporting members with steel screws. The

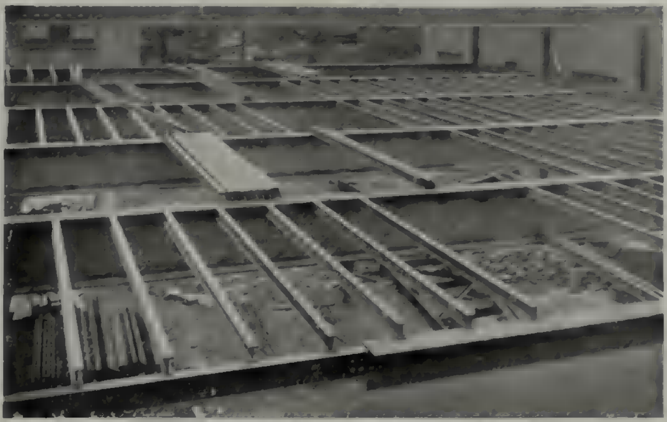


FIG. 4. I-BEAMS IN PLACE FOR BATTLEDECK FLOOR

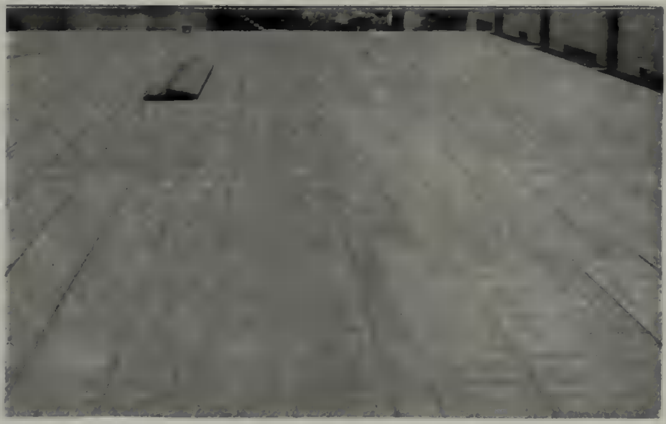
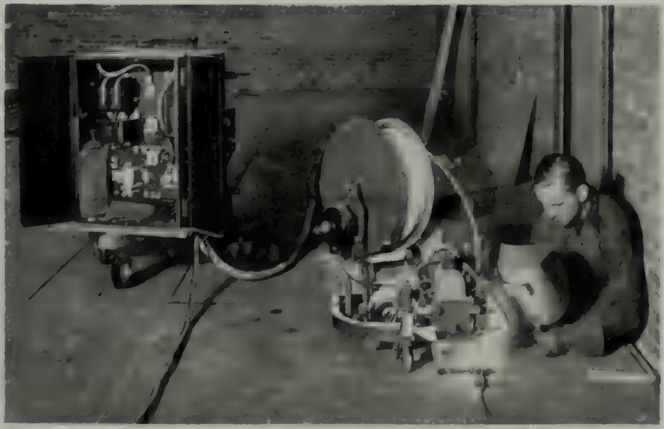
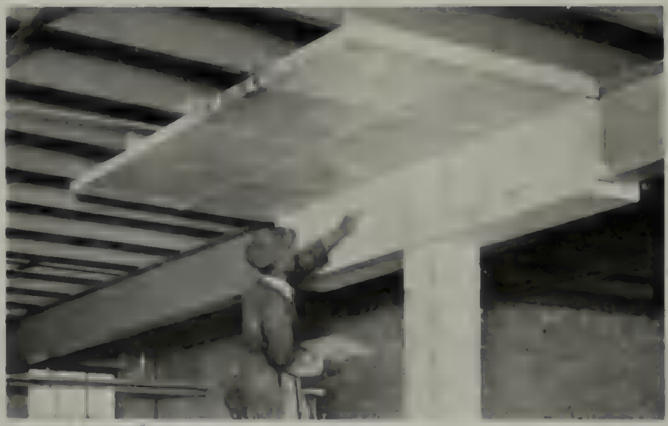


FIG. 5. STEEL PLATES IN PLACE READY FOR WELDING



General Electric Company

FIG. 6. CONTINUOUS AUTOMATIC ARC WELDING AT WORK



Structural Gypsum Corporation

FIG. 7. PRECAST GYPSUM FIREPROOFING SUSPENDED UNDER BEAMS AND GIRDER

flat sheets are continuous over the supports, increasing the strength of the construction and forming a series of air pockets as a third insulating medium. Purlin spacing up to 6′–0″. Mineral surface roofing. Thickness of corrugated sheets from ¼″ to 5/16″. Flat sheets from 3/16″ to ¼″. Combined weight of sheets from 4 to 8 pounds per square foot. Low maintenance cost. High salvage value. Heat and fire-resistant properties of Transite.

GYPSTEEL FLOOR AND CEILING CONSTRUCTION

Structural Gypsum Corporation

Standard structural rolled steel sections, or welded, open-web steel joists with Gypsteel precast floor slabs and suspended Gypsteel precast ceiling slabs. Slabs made of calcined gypsum with a small percentage wood planer chips. Approved for fully fireproofing construction for live loads up to 150 pounds by Building Departments of principal cities.

Ceiling slabs

2″ thick suspended underneath the steel floor members to form a flat ceiling and to fireproof the supporting steel. Slabs reinforced with ¼″ x ⅜″ flats running lengthwise and projecting from the end of the slabs. The slabs hung from the reinforcing by hangers attached to the steel. The beveled and rabbetted joints filled with grout.

Floor slabs

2½″ thick reinforced with 3/16″ cold-drawn wire rods projecting about 2½″. The projecting ends of opposite rods in abutting slabs tied together with a mechanical device forming a continuous reinforcing. The joints similar to those in the ceiling slabs filled with gypsum grout. Length of slabs 2′–6″.

Girder fireproofing

2″ thick reinforced soffit slabs.

Dead loads

Floor and ceiling slabs combined, 21 pounds per square foot.

STEEL PANEL CONSTRUCTIONS

BATTLEDECK STEEL FLOOR CONSTRUCTION

Sponsored by the American Institute of Steel Construction
(Figs. 4, 5, 6, 7)

I-beams 3″, 4″ or 5″ deep, spaced approximately 24″ apart, supporting steel plates which have their edges over the centerline of the beam. Except for extremely heavy loads 3/16″ or ¼″ plates 24″ wide are sufficient to meet building requirements. Automatic welding equipment traveling along the seam between the edges of the plates weld them together and at the same time weld them to the top flange of the beam. The result is a built-up T section with the plates

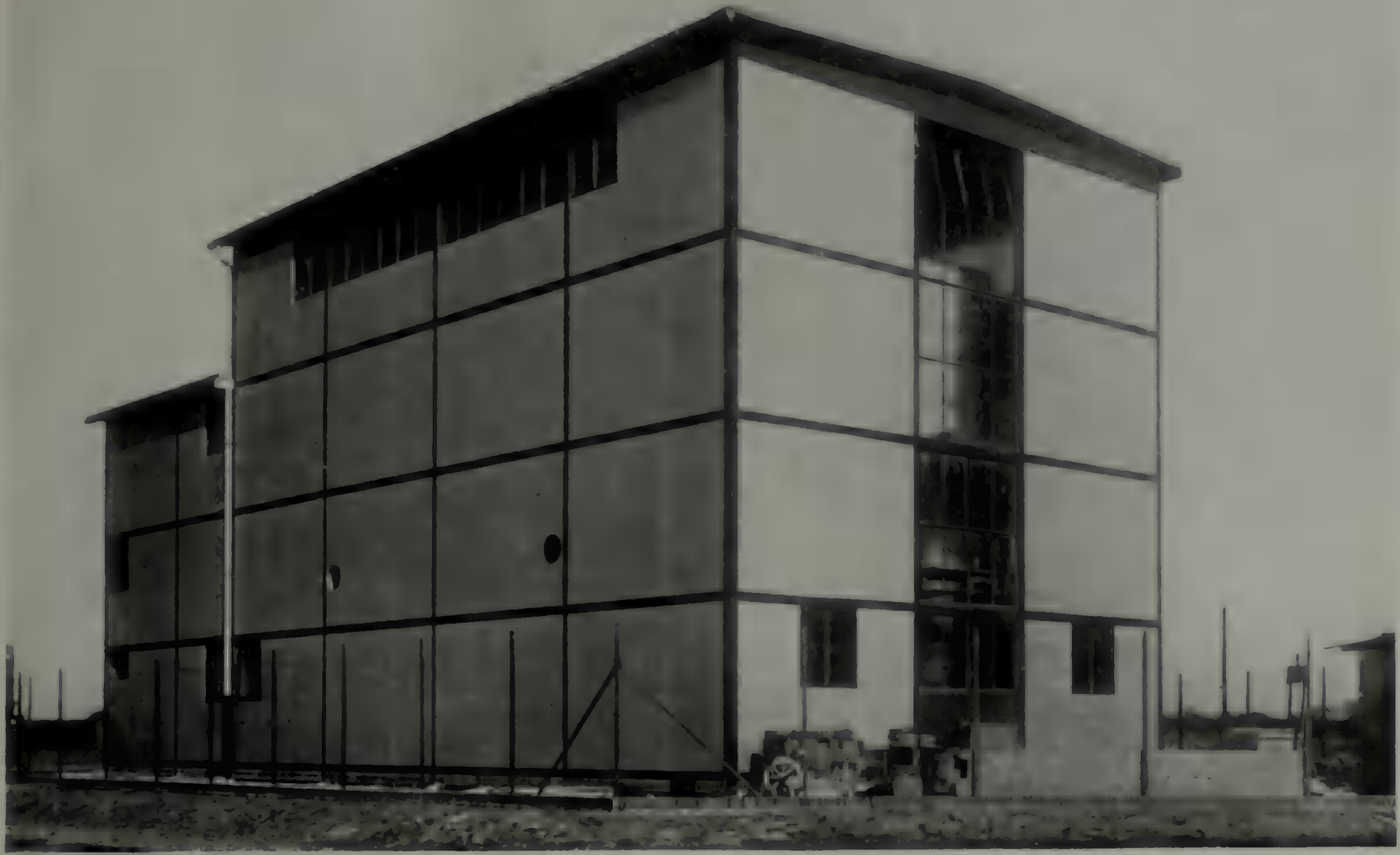


FIG. 1

COMBINATION STEEL FRAME AND STEEL LAMELLA CONSTRUCTION FOR GERMAN TRANSFORMER STATION. THE PLATES ARE ACTIVE IN CARRYING STRESSES, ELIMINATING WINDBRACING AND PERMITTING WIDER COLUMN SPACING

acting as the upper flange and the beam acting as the vertical part of the T. The weld being immediately over the center line of the beam provides a connection that is at the theoretically most efficient position. In construction it will be found necessary to weld the bottom flange of the I-beam to the shelf angle of the main girder in order to provide continuity or a fixed end bending moment. The actual amount of welding necessary to develop the strength of the T section is only about 25% to 40% of the length of the seam. Spotwelding has been used in recent constructions. Required fire protection by metal lath and plaster, or by precast blocks of fireproofing inserted or suspended on the lower flange of the small beams. Either type can be erected after the welding. The floor can be covered with cement, rubber tile, linoleum, cork, or left exposed.

Engineering data

By using a 3″ 5-7/10 pound I-beam spaced 24″ centers, and a 3/16″ plate, such a floor construction will carry a total load of 190 pounds per square foot on a 10-foot span with a deflection of 0.104″. The same floor will carry a total load of 85 pounds per square foot on a 15 foot span with a deflection of 0.235″. The weight of the steel work, including beams and plates, will be 10½ pounds per square foot. By a proper variation in the size of the beams and the space between them, together with the thickness of the plates, it is possible to develop a floor to meet almost any condition of loading with a dead-load saving of from 25% to 50% of present construction. Automatic traveling welding equipment is on the market that will weld the seam at the rate of approximately 90 feet per hour and at a cost estimated to be approximately 3c per linear foot.

Advantages

Elimination of excessive dead load. Reduced column and footing requirements. Decreased height of floor construction. Determination in advance of stresses in all parts of a floor which will recover 100% of its deflection due to live loads when these loads are removed. Erection under any weather conditions. The construction generates a solid steel deck which will act as a girder to prevent any twisting distortion to the building when subjected to wind or earthquake. The floor construction can be carried out into the walls to provide spandrel construction to support the outside walls. It will provide a working floor for other trades and in many places eliminate the necessity of temporary planked floors.

FIGS. 9, 10, 11
HOLORIB DECKS

HOLORIB DECKS

Detroit Steel Products

(Figs. 9, 10, 11)

Steel roof, floor and wall plates fabricated from copperbearing or galvanized steel sheets reinforced by self-contained triangular ribs rolled into the sheet longitudinally; the plates welded, riveted or anchored with specially formed anchor clips to the purlins or joists. The sheets dovetail and interlock ends and sides. Spacing of purlins or joists from 4 feet to 8′–6″. Gauge of sheets from 24 to 18. Roof insulation with pressure-resisting types of insulation full-mopped with hot asphalt. Final waterproofing with built-up felts. For steep surfaces anchoring of insulation with self-expanding nails that do not penetrate the sheet. Can be used as floor with and without concrete. The plates can be made of aluminum or lead coated.

Engineering data

COMPARATIVE ROOF WEIGHTS

	lbs. per sq. ft.
Waterproof covering	1.5
1-in. insulation	1.5
Steel deck	1.6 to 2.9
Total approximately	5 lb.

THERMAL CONDUCTIVITY OF HOLORIB

The following table gives the thermal conductivity of Holorib roofs, including in each case a standard composition roofing:

Holorib without insulation	0.781 B.t.u.
Holorib and ½″ insulation	0.358 B.t.u.
Holorib and 1″ insulation	0.232 B.t.u.
Holorib and 1½″ insulation	0.172 B.t.u.
Holorib and 2″ insulation	0.136 B.t.u.

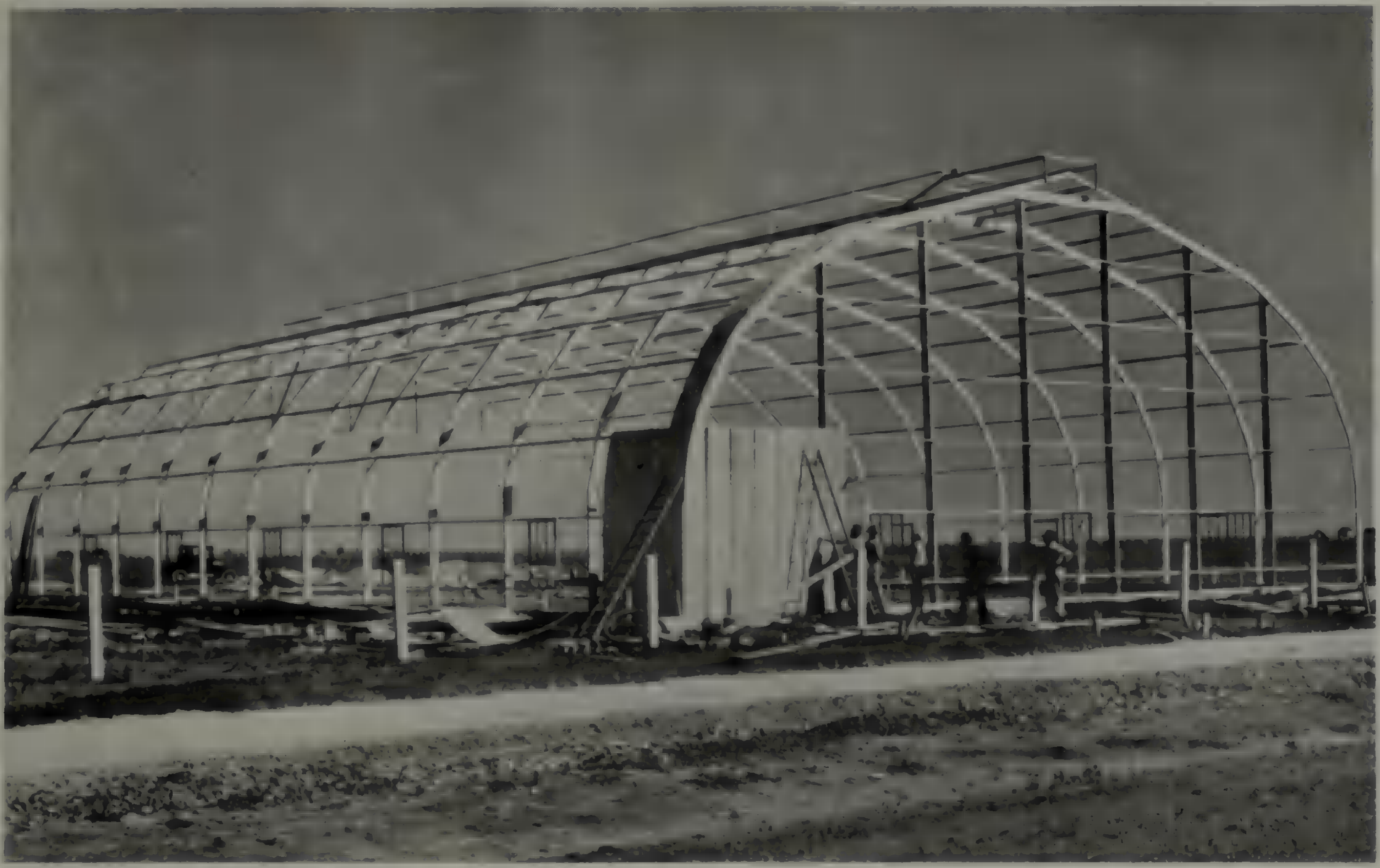
Insulation referred to above may consist of such pressure-resisting materials as cork, Celotex, Insulite, J-M Board, etc. The values of the thermal conductivity are taken from data published by the American Society of Heating and Ventilating Engineers Guide (1930 Edition).

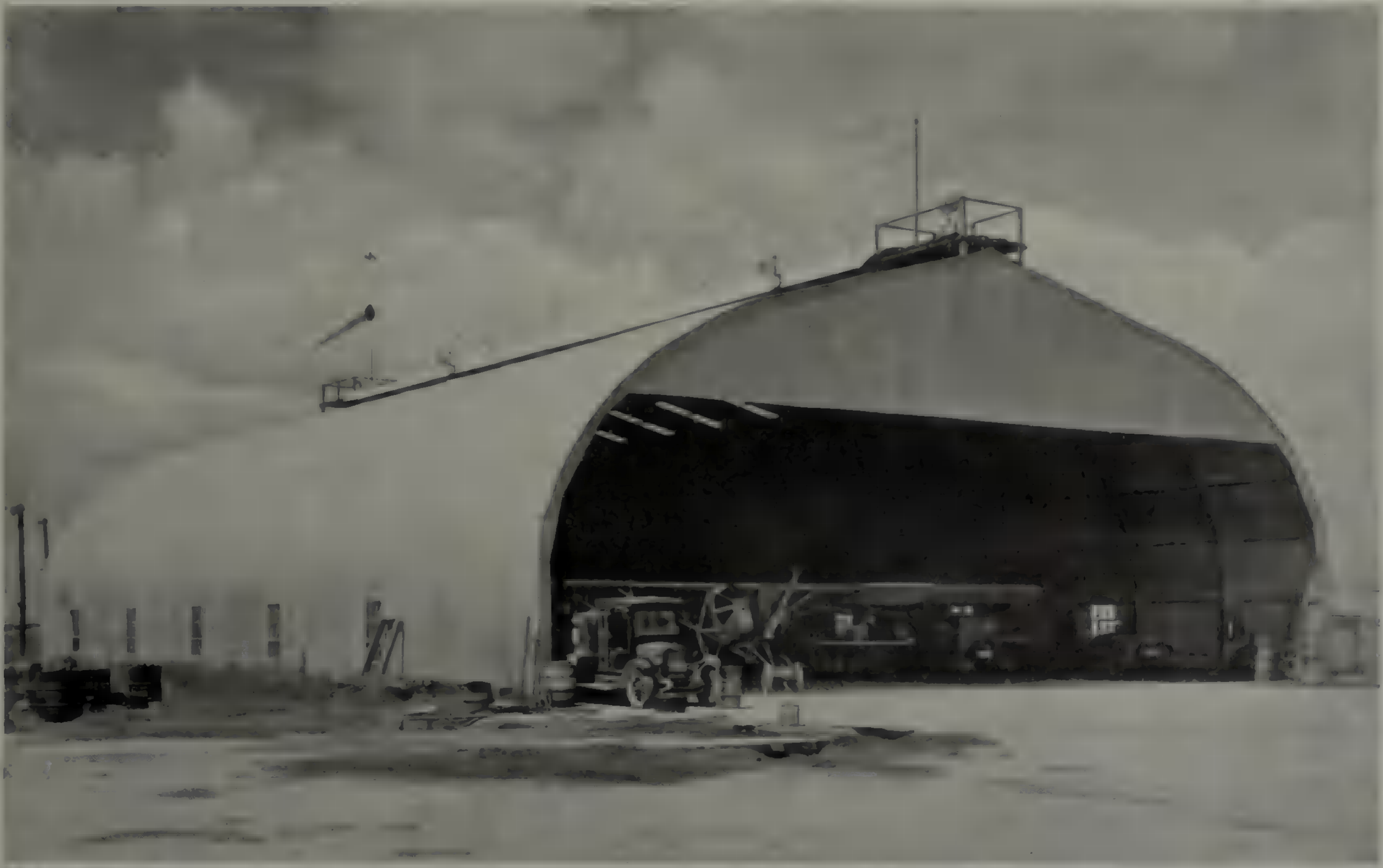
Cost data

24-gauge Holorib over bar joists, with ½″ insulation and a four-ply built-up roof, will cost from 30c to 32c per square foot, while 20-gauge Holorib with the same type of insulation will cost from 31c to 34c per square foot. An extra ½″ of insulation will run this cost up to 37c to 41c per square foot.

Advantages

Quickly erected in any weather. Negligible contraction and expansion. Minumum maintenance. Elimination of excessive dead load. Watertight. Rigid self-adjusting foundation for insulation and waterproofing.





The Lincoln Electric Company

FIGS. 12, 13

HANGAR AT HOUSTON, TEXAS. ARC WELDED STRUCTURAL CHANNELS. CORRUGATED SHEET IRON. HANGAR WITHSTOOD A CYCLONE THAT DEMOLISHED AN ADJOINING BRICK HANGAR

LOW COST PRODUCTION OF WROUGHT IRON

THE ASTON PROCESS (*)

Production of wrought iron at lower cost and increased tonnage has been developed by the A. M. Byers Company, Pittsburgh, Pa.

The even dissemination of silicate slag throughout the pure iron is accomplished by pouring refined iron at high temperature into a bath of silicate slag at a lower temperature. Mixing in this way permits all other steps of the process to be accomplished as separate units similar to those followed in the making of steel. The molten iron carries dissolved gases in large amounts. When poured into the slag, the metal is continuously solidified, and the gases are released, causing an infinite number of small explosions which disintegrate the iron into small globules. These settle to the bottom of the cup, and form a spongy mass intermingled with the liquid slag. The surplus liquid slag is poured off, and the spongy ball of metal at a white heat is put through an electric press and compacted into blooms suitable for rolling. Instead of the 200 to 300-pound blooms possible in hand puddling, the new process can produce blooms weighing three tons or more, offering the advantages of more economical rolling. Every step in the process is subject to scientific analysis and mechanical control.

LIGHTWEIGHT METAL

ALUMINUM

Approximately 3 per cent of the new aluminum produced by the Aluminum Company of America finds its way into the building industry.

Curtain type doors installed in a roundhouse for the Norfolk and Western Railroad weigh 323 pounds as opposed to 1.080 pounds for galvanized steel doors of similar size. The doors are operated by means of a hand chain and gears. In the case of the aluminum doors, the gears are in the ratio of 6.8 to 1; while in the case of the galvanized steel doors, this ratio is 21 to 1. The aluminum doors are resistant to coal gases found in the atmosphere around a roundhouse.

The initial cost of structural aluminum shapes is about 2.6 times as great as steel beams of equal strength. The greater initial cost may in many cases be offset by the reduction in dead weight of the building, reduced cost of haulage, erection and maintenance, and by the advantages of the specific properties of aluminum. Structural aluminum shapes are employed in oil fields and refineries because of the resistance of the metal to hydrogen sulphide and in rubber factories because of its resistance to sulphur. The relatively high reflectivity of aluminum for ultra-violet radiation and heat radiation indicates a number of possible uses of this metal and of aluminum foil and paint.

LIGHTWEIGHT CONCRETE

AERATED CONCRETE

Trade names: *Aerocrete*, *Gasconcrete*, *Bubblestone*. Made by processes depending upon the introduction of chemicals to generate gases which cause the mass to rise much like baker's dough. One method is to mix portland cement, hydrated lime, and a small amount of finely powdered aluminum and lightweight aggregate, usually from 1 to 3 parts by weight. When the mass is tempered with water, hydrogen is liberated and the mass rises.

Weight: generally between 40 to 50 pounds per cubic foot.

Compressive strength: about 500 pounds per square inch at the usual weight.

Coefficient of thermal conductivity: 0.17 B.t.u. as compared with the values of 0.45 for ordinary concrete and 0.03 for cork.

Fireproof. Small absorption. Can be worked with woodworking tools, sawed, grooved and spiked. Used in precast units or cast in place.

HAYDITE CONCRETE

Haydite

A lightweight, heat-treated clay aggregate. The raw material consists of ordinary clay or shale crushed to a maximum size of one-inch lumps. The natural moisture content of the shale or clay as it comes from the pit is retained. The crushed material is charged into a rotary kiln. As the lumps roll down the kiln they are preheated at a temperature of approximately 800°, which vitrifies a thin layer of the outside of each particle, thus confining the combustion gases resulting from subsequent burning of the inner portion of the raw material. When the preheated particles reach the burning zone they are subjected to intense heat from a second fire nozzle, which brings them to incipient fusion, approximately 2000°. At this point the vitrified outer layer is softened and the sudden rise in temperature causes the confined gases to expand, puffing out the lumps to 2½ times their original size. The expanded material partially fuses forming porous clinkers composed of minute cells each surrounded by a wall of vitrified clay. The cooled clinker is crushed and screened into sizes of standard aggregates.

Weight: The fine grade, approximately 1300 pounds per cubic yard; the coarse grade, approximately 1150 pounds per cubic yard.

Haydite concrete

Concrete using Haydite as aggregate weighs 100 pounds per cubic foot as compared with 150 pounds per cubic foot for concrete made from standard aggregates. It has the strength of standard concrete. Classified as approved fire-resistant material. Monolithic construction, precast slabs and blocks.

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*Executives Service Bulletin, Metropolitan Life Insurance Co.

RIGID AND SEMI-RIGID INSULATING BOARD

SUMMARY OF DATA (*)

Name of Product	Mame of Manufacturer	Plant Location	Raw Material	Strength		Conductivity †
				Modulus of Rupture*	Tensile Strength*	
				Lbs. per sq. in.	Lbs. per sq. in.	
Maizewood	Maizewood Products Corp.	Dubuque, Iowa	Cornstalks	505	204	0.372 to 0.408
Insoboard	Stewart Insoboard Co.	St. Joseph, Mo.	Wheat Straw	352	340	0.324
Celotex	Celotex Co.	New Orleans, La. (Marrera, La.)	Sugar Cane Bagasse	338	292	0.329 to 0.461
Flaxlinum	Flaxlinum Co.	St. Paul, Minn.	Flax Straw	...	33	0.31
Fibrofelt	Union Fiber Co.	Winona, Minn.	Flax Straw	...	....	.....
Insulite	Insulite Co.	International Falls, Minn.	Wood Pulp Tailings	569	208	0.339 to 0.440
Nu-Wood	Weyerhauser	Cloquet, Minn.	Wood Waste	...	...	.....
Masonite	Mason Fiber Co.	Laurel, Miss.	Wood Waste	386	212	0.328 to 0.543
Firtex	Firtex Insulation Board Co.	St. Helens, Ore.	Wood Waste	...	...	.....
Maftex	McAndrews and Forbes		Spent Licorice Root	...	...	.....

*Averages. †B.t.u. per sq. ft. per 1° F. for 1 hr. per 1 in. thickness. These values vary considerably.

PLASTICS

LUMARITH MOLDING MATERIAL

Celluloid Corporation, New York

A cellulose acetate colloided with suitable plasticizers, pigments and solvents. Furnished in slabs, chips or powder ready for molding by heat and pressure. Scrap and flash from the mold is reworkable, eliminating waste. Manufactured in sheets, rods and tubes. Furnished in any color, opaque or transparent. Transparent products claimed to be partially transparent to ultra-violet radiation. Hard, normal or soft qualities. Non-inflammable. High electrical insulation.

Working properties

Articles made from Lumarith molding material may be worked by any of the following mechanical operations: sawing, machining, polishing, cementing, drilling, tapping, threading, etching, stamping, engraving.

Cost

Molding material about $1.00 per pound. Manufactured products about $2.00 per pound.

Physical and chemical properties

	Transparent	Pigmented
Specific Gravity	1.29	1.56
Density, oz. per cu. in.	0.745	0.90
Specific Volume, cu. in. per lb	21.5	17.8
Ultimate Tensile Strength, lbs. per sq. in.	2800–3600	3000–4200
Compressive Strength, lbs. per sq. in.	4000	11.000
Transverse Strength, lbs. per sq. in.	6300	7000
Impact Strength—Charpy cycles, ft. lbs. per sq. in.	3.2	2.2
Brinell Hardness—10kg. load 2.5 mm. Ball. —1 min. duration, kg. per sq. mm	7–11.5	7–16
Thermal Expansion, in. per in. per °C.	0.000156	0.000102
Thermal Conductivity—cal. per cm. —per sec. per °C	0.00047	0.00054
Softening Temp., — °F.	140-150	160-180
Water Absorption in 48 hrs. (room temperature), —%	1.9	1.4
Light Resistance	Practically no discoloration	
Chemical and Solvent Action of Various Reagents on Lumarith Materials		
(a) Alcohols, such as methyl, ethyl, butyl	Superficial spotting	
(b) Vegetable oils, such as castor oil	No effect	
(c) Mineral oils	No effect	
(d) Strong mineral acids ($H_2 SO_4$, HNO_3,)	Decomposed	
(e) Strong alkalies	Decomposed	

Present applications

Auto and airplane parts. Containers. Cutlery handles. Electrical fittings. Glass substitutes. Hardware. Radio cabinets and parts. Toiletware. Bathroom accessories. Display fixtures. Office equipment. Can be used for furniture and wall treatment.

(*) Compiled for The Architectural Record by L. K. Arnold, Assistant Chemical Engineer, Engineering Experiment Station, Iowa State College.

REMOTE CONTROL

RADIO CONTROL FOR GARAGE DOOR OPERATORS

Barber-Coleman Company, Rockford, Ill.

Equipment

Transmitter installed in the automobile consisting of timer fastened on the instrument board, spark coil enclosed in watertight box clamped on the frame and transmitting antenna suspended under the car. Power for the transmitter drawn from car battery. Receiving unit inside the garage controlled from the car by means of radio impulses and adjusted to operate only at certain series of impulses so that no car but the proper one can open the door. Motor-driven operator made in types adapted to folding, swinging, sliding and overhead doors.

Operation

The driver pulls a knob on the instrument board as he approaches the garage. The garage door opens, the garage lights are lighted, and he drives in without stopping or getting out of the car. The door may be closed and the garage lights extinguished from the car. Lights and door can be operated independently of each other and of the radio control by means of wall switches in the garage or in the house. The operator stops the door at the end of the closing stroke so the door closes completely without slamming. When the door is closed, the operator locks it automatically. A safety device automatically disconnects the operator drive from the door when the latter encounters an obstruction. In case power supply is cut off, the door can be unlocked, opened or closed and locked by hand without adjustment.

Cost

Transmitter and receiver installed—$155.00. Cost of operator varies with type of door, from $160 to $325 installed.

AUTOMATIC CONTROL

PHOTO-ELECTRIC RELAY

General Electric Company

A device to control electrically operated equipment in response to an increase or decrease in the intensity of light.

Operation

Controlling element: the electron discharge photo-electric tube. With voltage of proper magnitude applied between the two elements, the current it passes is proportional to the amount of light shining on it. The current is amplified by a vacuum tube; a sensitive relay is connected in the plate circuit of the tube and is energized or de-energized in accordance with the amount of light on the photo-electric tube.

The contacts of the relay control the coil circuit of a contactor. When the sensitive relay in the plate circuit of the amplifier is energized, it will first open the normally closed contacts and then close the normally open contacts. The relay therefore either makes or breaks the coil circuit of the contactor. In operation the relay is practically instantaneous.

Application

1. OPERATION OF MAGNETIC TYPE COUNTER

a. Counting items such as bags or boxes of material.

b. Counting traffic either pedestrian or automotive passing a definite point.

2. CONTROL OF MECHANISMS

a. Turning on and off illumination of streets, store windows and electric signs, depending on the intensity of outside light in cases where time switches lack flexibility.

b. Automatic door operators. A ray of light focused on a photo-electric tube passes in front of the door. The tube and the light are placed several feet from the door, and as the person approaches, his body interrupts the light ray directed at the tube. When the ray is interrupted, a hydraulic door opener is set to work through the agency of the photo-electric relay. The length of time during which the door is held open is variable by adjusting the control. Especially adapted for doors to restaurant kitchens, garages, etc.

c. Fire alarm. Placed over furnaces, registers, space heaters, etc., a puff of smoke will put the relay in action.

d. Burglar alarm. A special type sensitive to beams in the invisible end of the spectrum.

Many additional possibilities are open for consideration. Color filters make the relay responsive only to light of certain hues. Light louvres will shield the tube from all light save beams coming from certain directions.

THE THYRATRON TUBE

General Electric Company

A mercury arc rectifier with grid control. The power output to a given load on the rectified current circuit depends on the phase relation of the grid to the anode voltage. By shifting the phase of the grid voltage form in phase to 180° lagging the load can be varied from maximum to zero.

Application

CONTROL OF MOBILE LIGHTING

Application of a selsyn control unit ("Selsyn" is the *General Electric Company's* trade name for self-synchronous motors) and a thyratron tube unit takes the place of the present type of control using rheostat elements to vary the circuit voltage. The selsyn unit gives simultaneous control of any number of circuits while the thyratron provides uninterrupted voltage variation in the lighting circuit and gradual transition from one setting to another. The equipment is especially adapted to theatre and auditorium lighting, floodlighting of buildings, interior lighting, colorama, show windows and signs.

CONTROL OF AUTOMATIC DOOR OPENER

A metal plate with fixed electrical capacity is placed at the side of the door. When this fixed capacity is unbalanced by the application of variable capacity, such as tapping by a person's hand, a series of four thyratrons is set into action, each with a particular duty in an electrical circuit. The final thyratron operates a relay which releases a lock and starts a motor on the hydraulic door-opener. The circuit may be set for any sequence of contacts or touches, and will respond only to the sequence for which it is set. If, for example, "52" is the secret code, the metal plate is tapped lightly five times, followed by a pause of a few seconds, and then tapped twice. The thyratrons then function and the door swings open.

VACUUM TUBE ELEVATOR CONTROL SYSTEM

General Electric Company

The use of a three-element vacuum tube, known as a pliotron, in the automatic leveling of elevator cars is based on the increase of plate current when the tube changes from an oscillating to a non-oscillating condition. A suitable number of tubes are mounted on each elevator car. These tubes are normally in oscillation. The motion of the car as it approaches a floor level is made to stop the oscillation of the tubes, thus actuating relays. The relays govern control circuits which slow up the car and stop it at the correct position. The car is controlled running in either direction. In operation the elevator operator throws his car switch to the "OFF" position as he approaches the floor at which it is desired to stop. The car will be made to stop at the correct level without any attempt or work on the part of the operator.

Another application of the pliotron tube to elevator operation makes it unnecessary for the operator to watch his position in the hatchway. Devices similar to those used in automatic leveling are employed, and in addition a signaling equipment consisting of push buttons, lights and a bell is used. With this system the operator does not need to know where he is in the hatchway, and as long as he pushes the button for each floor called and shuts off his car switch each time the light flashes or the bell rings, he knows that he will make the required stop.

ARTIFICIAL ULTRA-VIOLET RADIATION

SUN-LAMP UNIT

Westinghouse Lamp Company

The lamp for this unit, the type S-1, is made in a bulb of ultra-violet transmitting glass (Corex-D). The bulb contains argon gas and a small quantity of purified mercury. The lead-in wires terminate in a pair of tungsten electrodes across which is shunted a V-shaped coil of tungsten filament. The required voltage regulation is automatically accomplished by a specially designed transformer housed in the base of the unit. The heat from the filament vaporizes some of the mercury in the bulb. The presence of this mercury gives rise to the ultra-violet radiation, while the filament and the hot tungsten electrodes radiate light and heat. The reflector is of special matte-finish aluminum selected on account of its ultra-violet reflecting properties. The lamp is operated on a transformer, and can only be used on 100–125 volts, 50–60 cycle A.C. The bulb will last several hundred hours. The price of the unit is $69.50. Bulbs for renewal, $7.50.

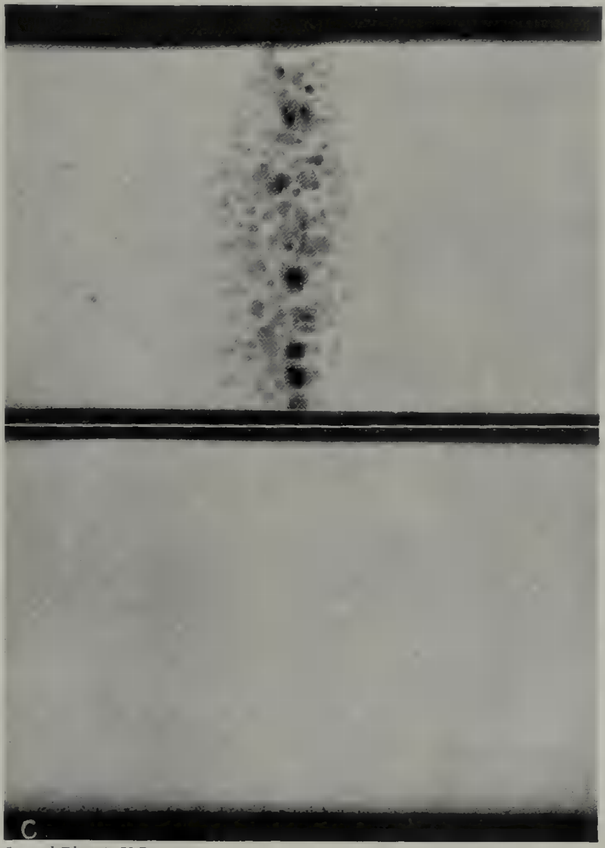
TUNGSTEN FILAMENT LAMP

Westinghouse Lamp Company

The S-1 Lamp unit is limited largely for home service in the general maintenance of health and cannot be recommended unqualified for general lighting installation. In order to obtain facts on installation of general interior lighting where a mild ultra-violet component to the illumination might be thought desirable, the following two types of tungsten filament lamp in ultra-violet transmitting bulbs have been made available by Westinghouse Lamp Co.:

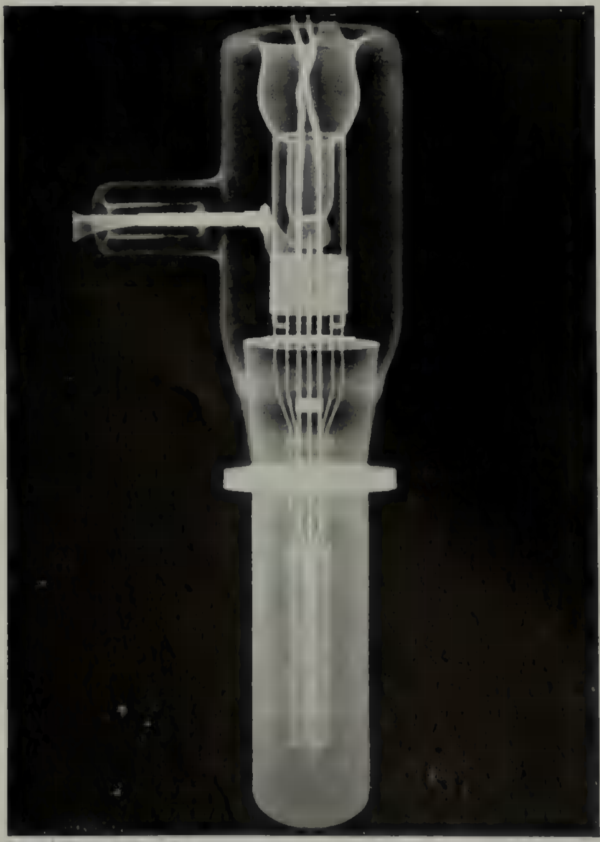
Watts	Voltage	Finish	Life Hours	Price
60	110–115–120	Inside Frost	300	$2.00
500	110–115–120	Inside Frost	300	$4.50

Due to the high temperature at which the filament operates, there is a certain amount of ultra-violet radiation from these lamps which does not exist in the case of the regular Mazda lamp in the 1000-hour class and in the regular glass bulb. These two lamps may be operated in any standard socket and on either A.C. or D.C. No claims are made at this time as to their performance or desirability. The lamps are suggested for experimental work chiefly. The ultra-violet emitted is so mild that even for continued periods of human bodily exposure, there is little likelihood of harm resulting. Reflectors of aluminum or chromium are recommended. Regular glass-enclosing globes are opaque to ultra-violet.



General Electric X-Ray Corp.

FIG. 14
RADIOGRAPHS OF TWO WELDS MADE BY THE SAME INDIVIDUAL, WITH TWO DIFFERENT WELDING METHODS. THE PERFECT WELD (LOWER) SHOWS THAT WITH A GIVEN METHOD ONE MAY BECOME SKILLED WHEN THE X-RAY IS USED AS A MEANS OF DEVELOPING A CORRECT TECHNIC



General Electric X-Ray Corp.

FIG. 15
BROADCASTING TUBE INSPECTED WITH X-RAYS AFTER ASSEMBLY

PROCEDURE CONTROL

INDUSTRIAL APPLICATION OF THE X-RAY

(Figs. 14, 15)

Reports of investigations in the field of metal radiography indicate that X-ray tests are very useful in the examination of metal castings, forging, welding and assemblies. Most of the microscopic defects in metal can be revealed by X-rays. Those which are most readily detected are shrinks, blowholes, pinholes, porosities and seggregates. Fine cracks and laminations in forgings can be revealed easily, provided the X-rays pass through the piece nearly parallel to the crack or lamination. Collateral tensile, impact, and fatigue tests indicate that when welds are free from defects as shown by X-ray pictures, they have the best physical properties.

NOISE CONTROL

NOISE-EXCLUDING DEVICE

Announcement has been made of the invention of another silencing device (the *Maxim Window Silencer*) to prevent noise entering rooms, while at the same time providing sufficient ventilation. It is intended especially for use in hospitals, hotels and offices. The installation of this unit is made by opening the window, slipping in the silencing unit, which includes the patented anti-noise device and an electric ventilating fan to draw in and expel air. The window is then closed so far as possible holding the unit in place. It can be adjusted to fit window frames of any size.

COMMUNICATION

RADIO

Many hotels and apartments are now being constructed with provisions made for installation of radio. A hotel installation generally consists of three or more receivers with channels from each terminating in jacks in the various rooms. The guests merely have to plug the loud speaker furnished into any one of the jacks, giving a choice of three or more programs. An apartment installation generally consists of several antennae installations with channels to the various apartments.

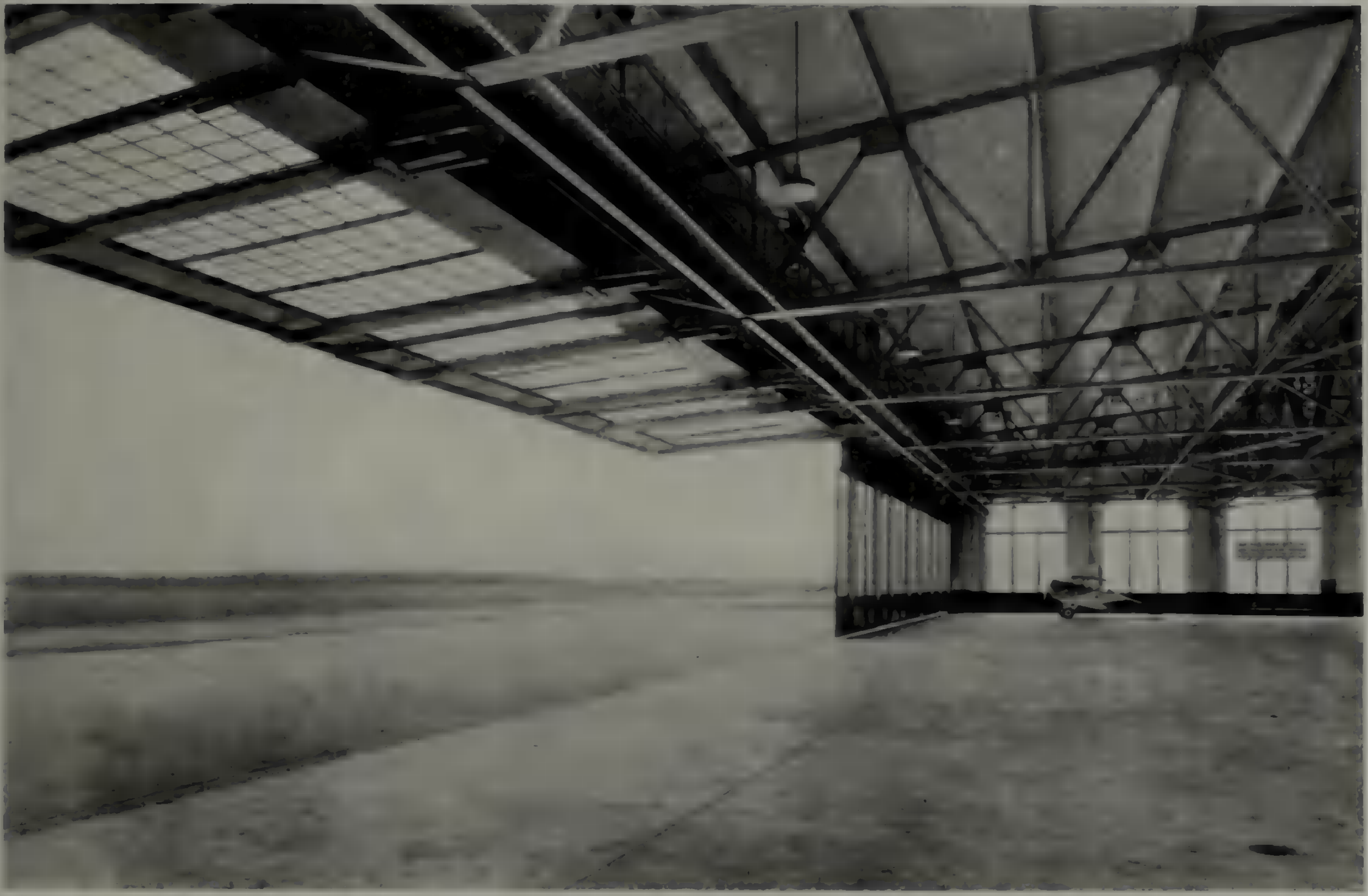
PORTABLE MOTION PICTURE AND SOUND EQUIPMENT

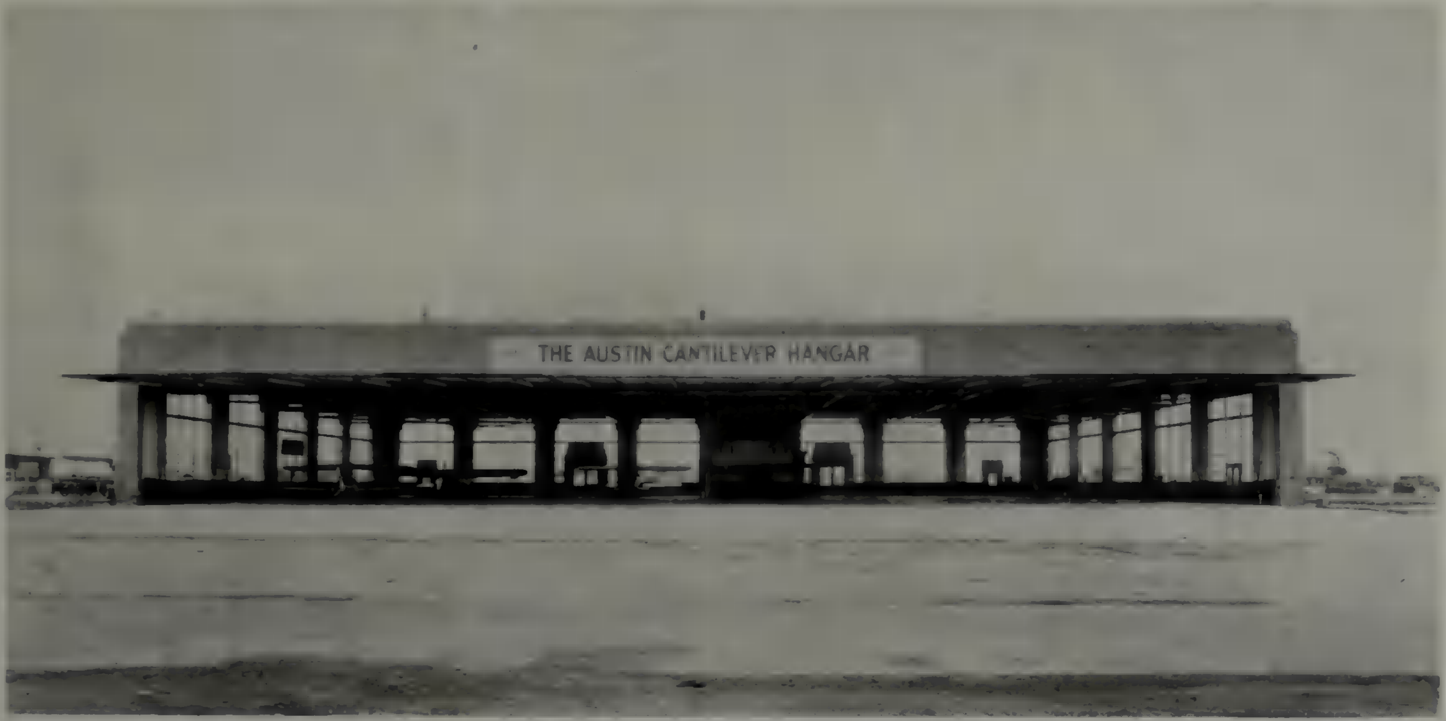
Several portable sound-reproducing equipments are now on the market. These reproducers can be obtained in trunks in which they can be packed away and shipped after use, or in conjunction with a movable stand which can be rolled in or out of the room. In the former case the necessary cords are furnished to connect the amplifier equipment with the horns, while in the latter the wiring and conduit are generally incorporated in the building construction.

K. Lonberg-Holm

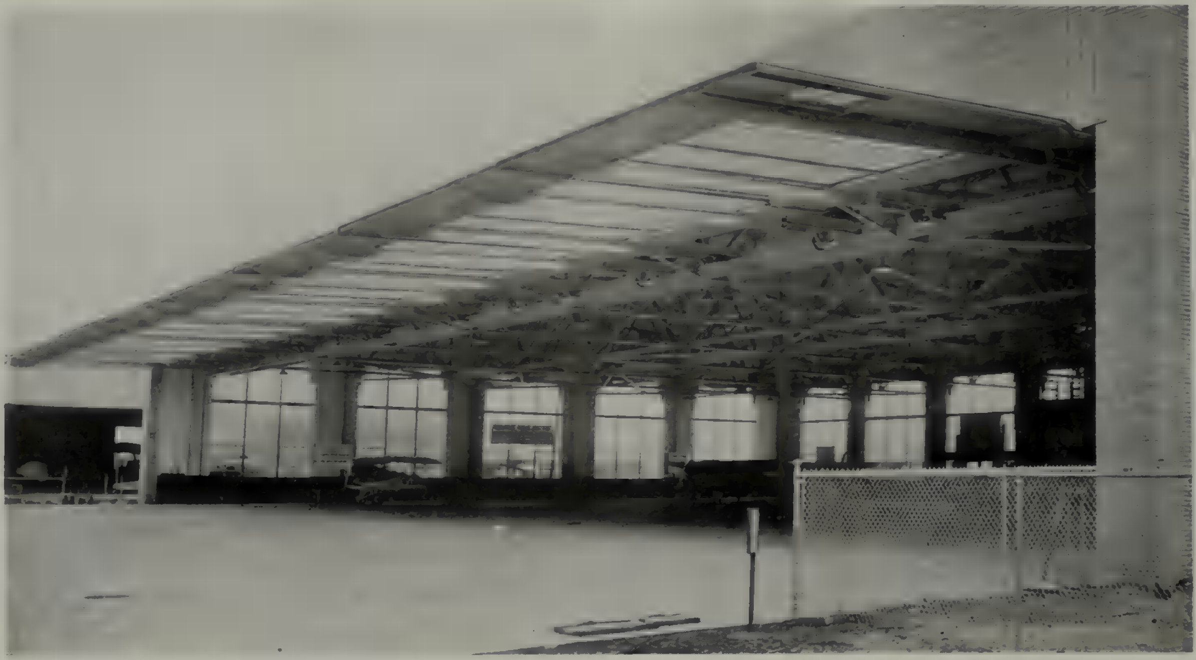
NOTES ON DRAFTING AND DESIGN

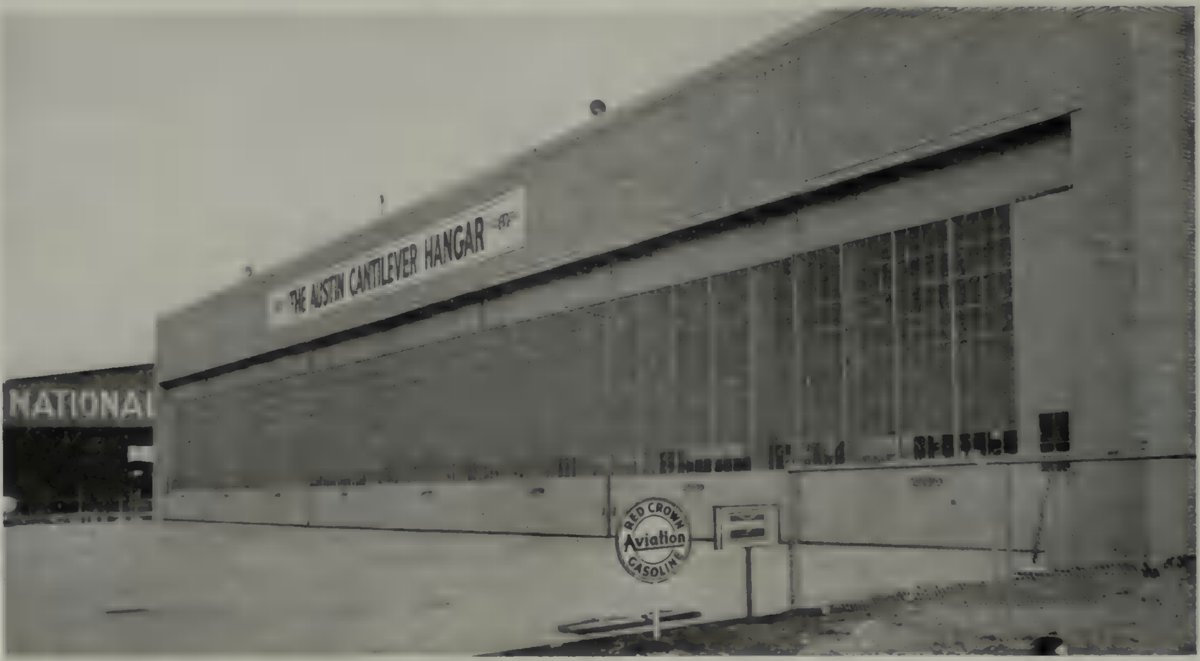
CANOPY TYPE HANGAR DOORS





AIRPORT, CLEVELAND, THE AUSTIN COMPANY, ENGINEERS AND BUILDERS

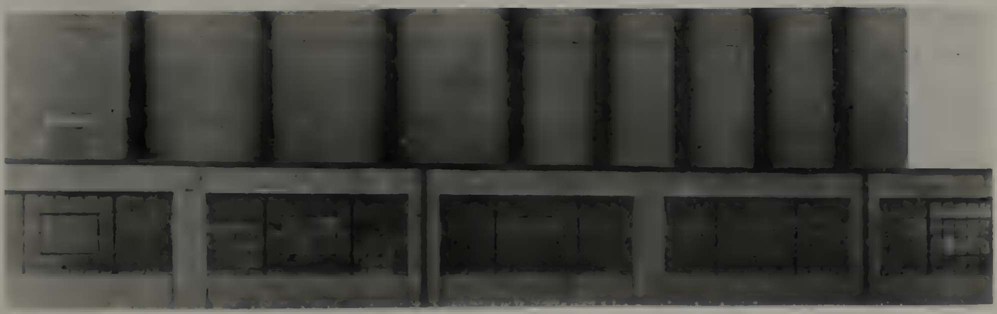


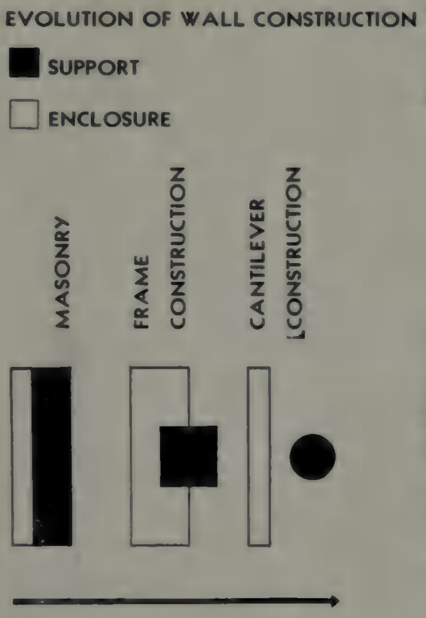


AIRPORT, CLEVELAND, THE AUSTIN COMPANY, ENGINEERS AND BUILDERS

Hangar of cantilever type construction with a single supporting column in the middle. Floor space 200 x 120 feet. The canopy type doors extend the entire length of the hangar on one side. The ceiling clearance under the doors and inside the building is 20 feet. The doors are divided into 8 sections each 25 feet long and can be operated as an entire unit or each unit separately. They are operated by two large lead screws, one at each end, which are rotated through beveled gears by means of a special 5 HP "Linc-Weld" Motor (Lincoln Electric Co.). The doors can be started, stopped or reversed from any point between the open and closed position. Automatic stop comes into operation when the doors have reached either the completely open or completely closed position. When closed the doors form a solid wall, except for two small pass doors, one in each end section.

SUPPORTS AND WALLS

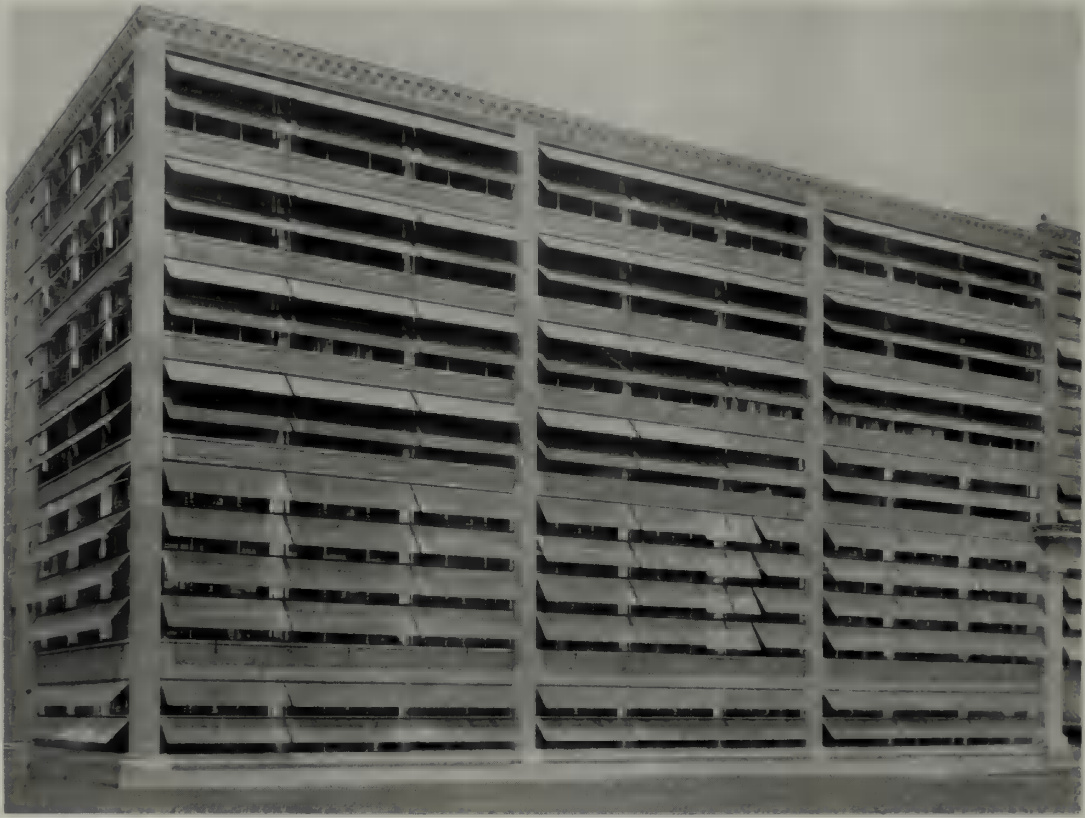




W. D. Morgan

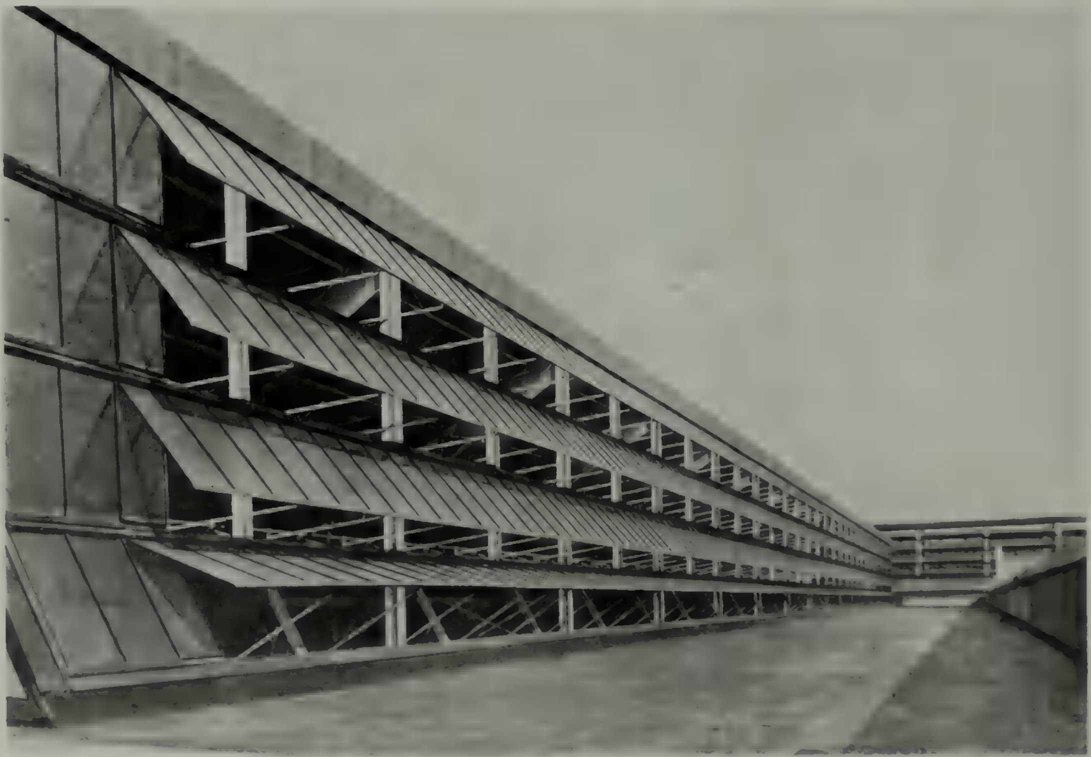
CENTRAL MANUFACTURING DISTRICT, LOS ANGELES

The masonry wall serves two functions: support and protection. Frame construction leads to segregation of supporting members and enclosing walls and to beginning of spatial separation. Use of steel and reinforced concrete reduces the size and the number of vertical supports. In the buildings shown above no attempts were made by the designers to disguise the specific character of the construction by emphasizing the vertical supports to suggest masonry construction.



David Lupton's Sons Co

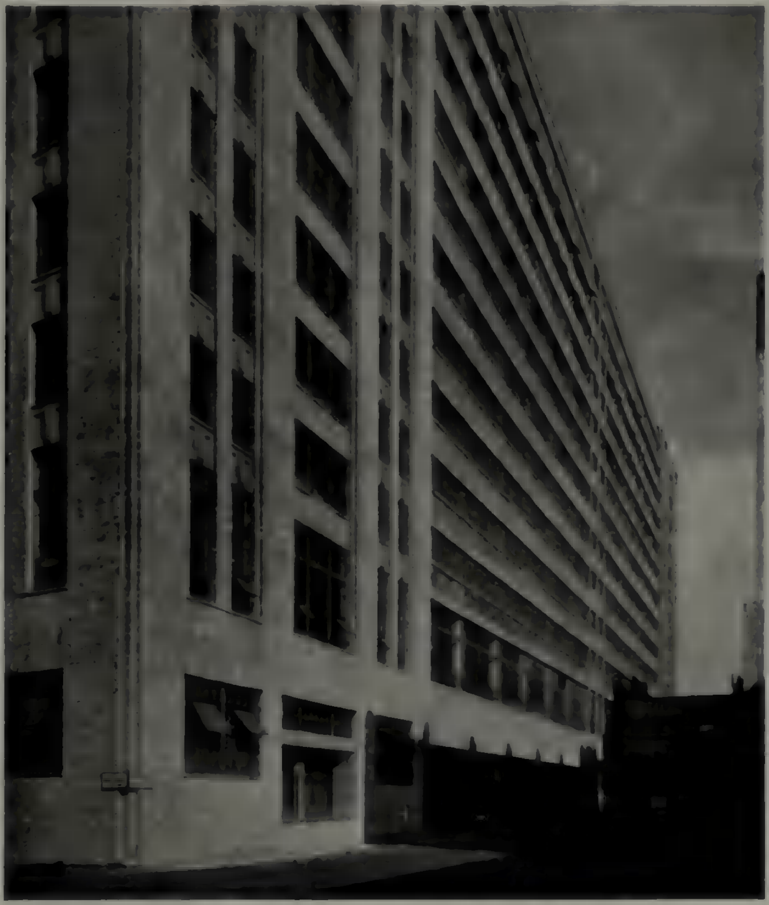
FIRESTONE TIRE AND RUBBER COMPANY, AKRON, OHIO



Truscon Steel Co.

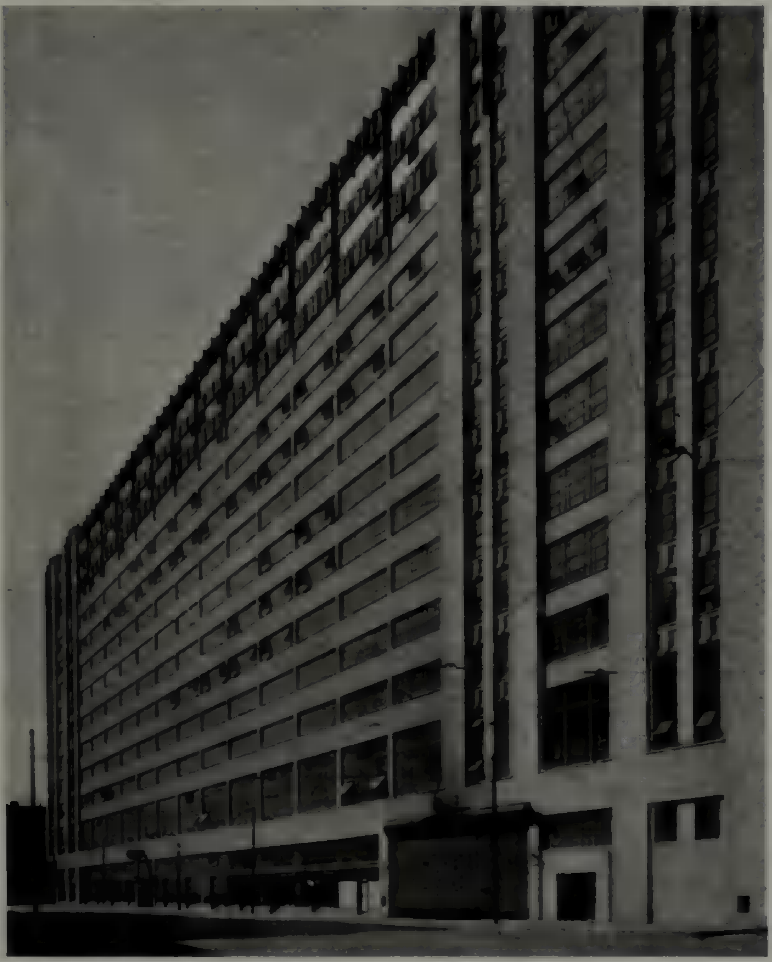
MONITORS, FORD MOTOR COMPANY, RIVER ROUGE

Differentiation of function, material and erection leads to spatial separation. The enclosing walls are designed to meet their specific purpose with a minimum of means. The spatial separation of individual units gives freedom in erection and flexibility in layout and operation. The supporting members are reduced to a minimum.



YARD ELEVATION

8" thick reinforced concrete spandrel, unplastered. Net unit cost: 63c per square foot.



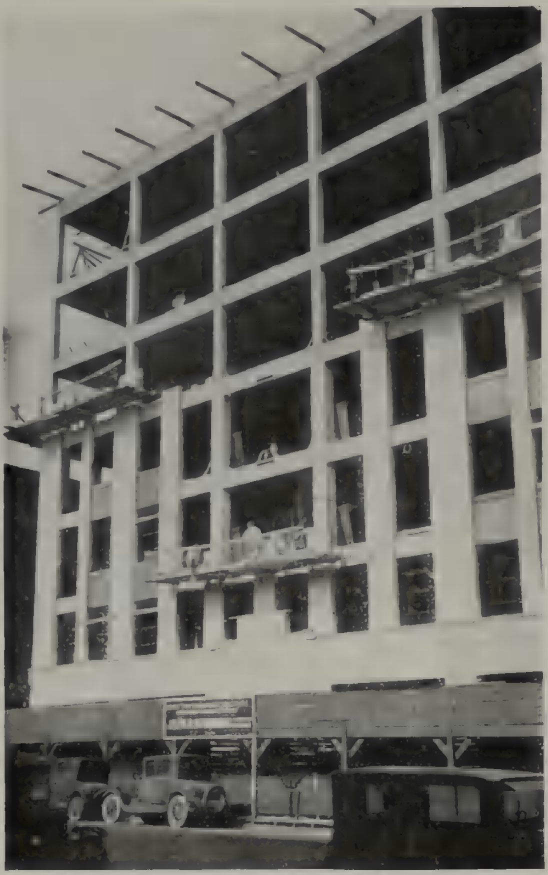
STREET ELEVATION

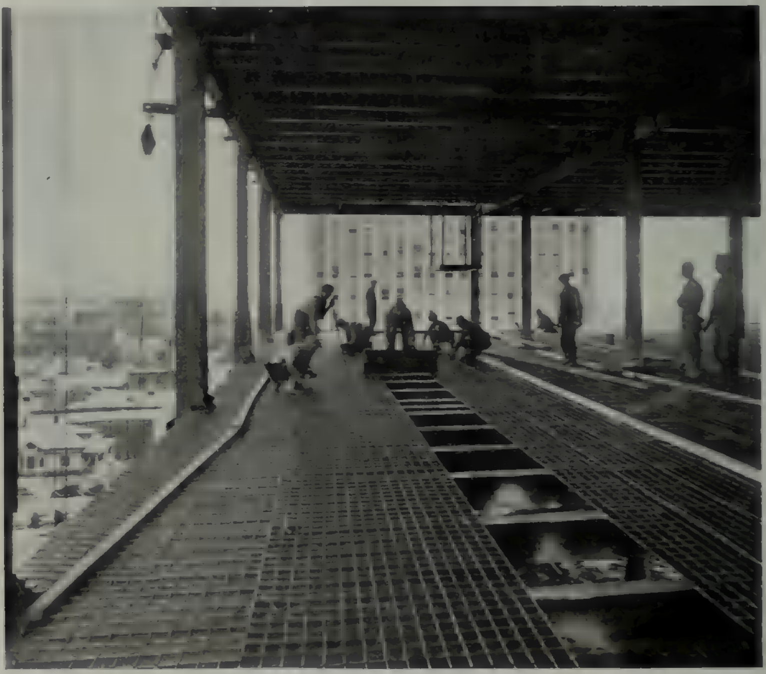
12" thick brick wall of 4" face brick and 8" backing brick unplastered. Net unit cost: $1.19 per square foot.

Support and floor construction the same on both sides. The arbitrary introduction of false masonry construction has increased cost, weight and thickness of wall.

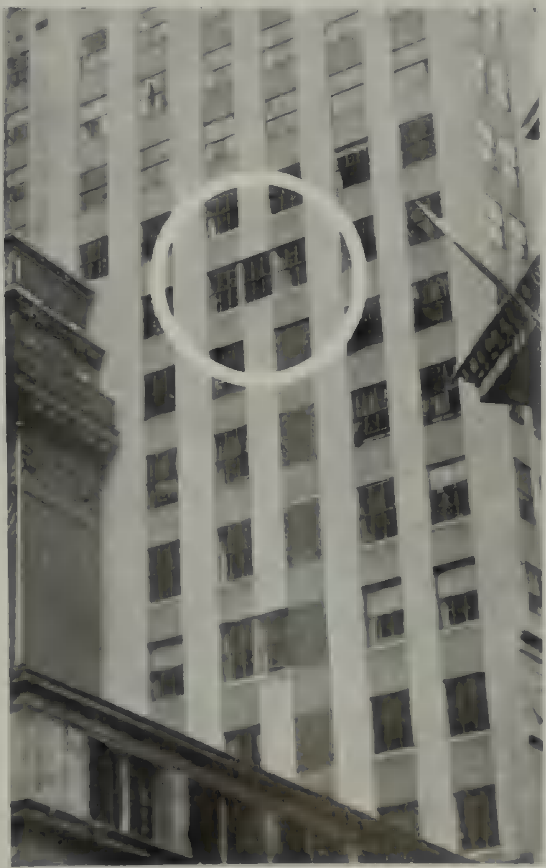
Paul J. Weber

NORTH STATION INDUSTRIAL BUILDING, BOSTON
TURNER CONSTRUCTION COMPANY

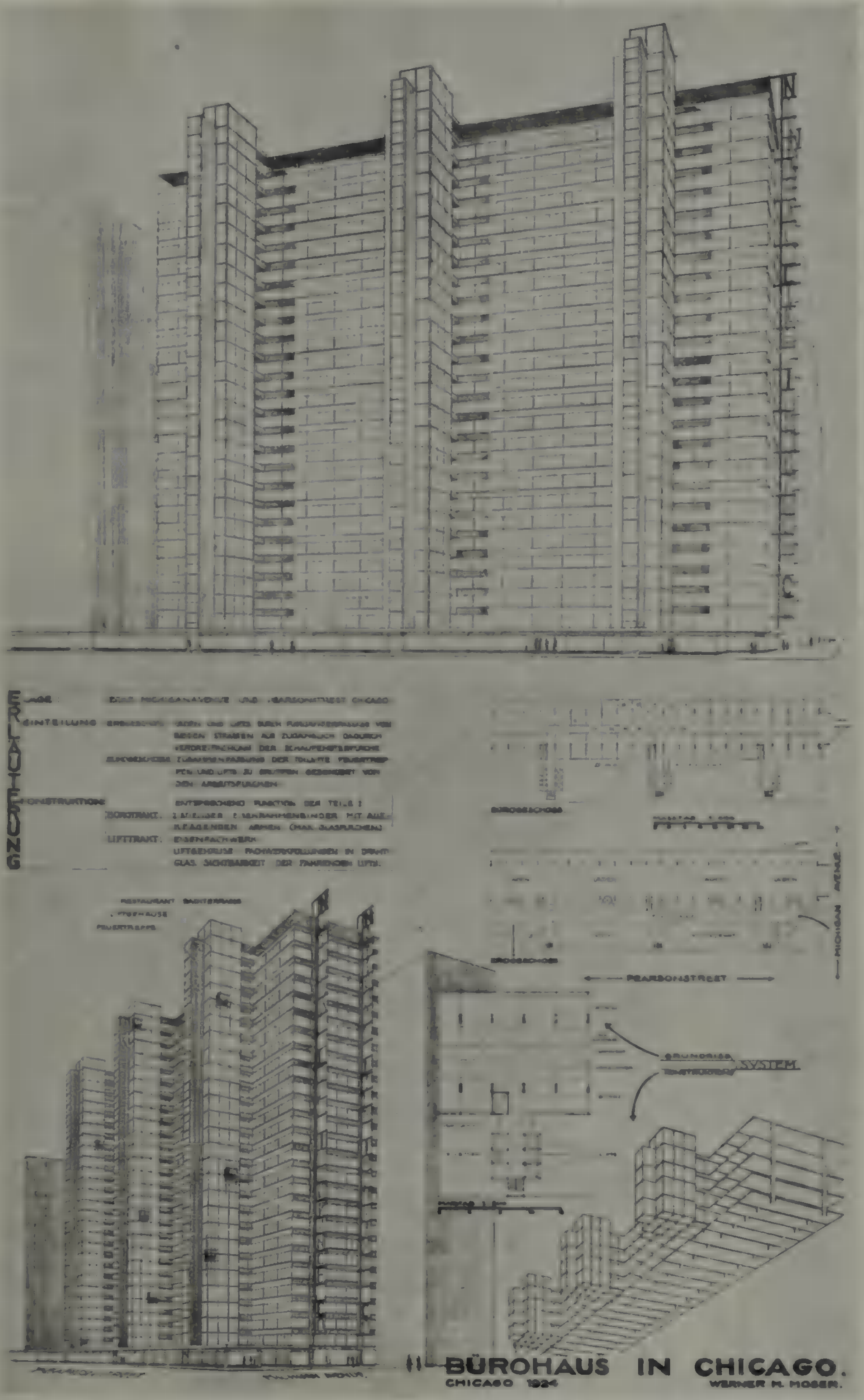




National Steel Fabric Co.

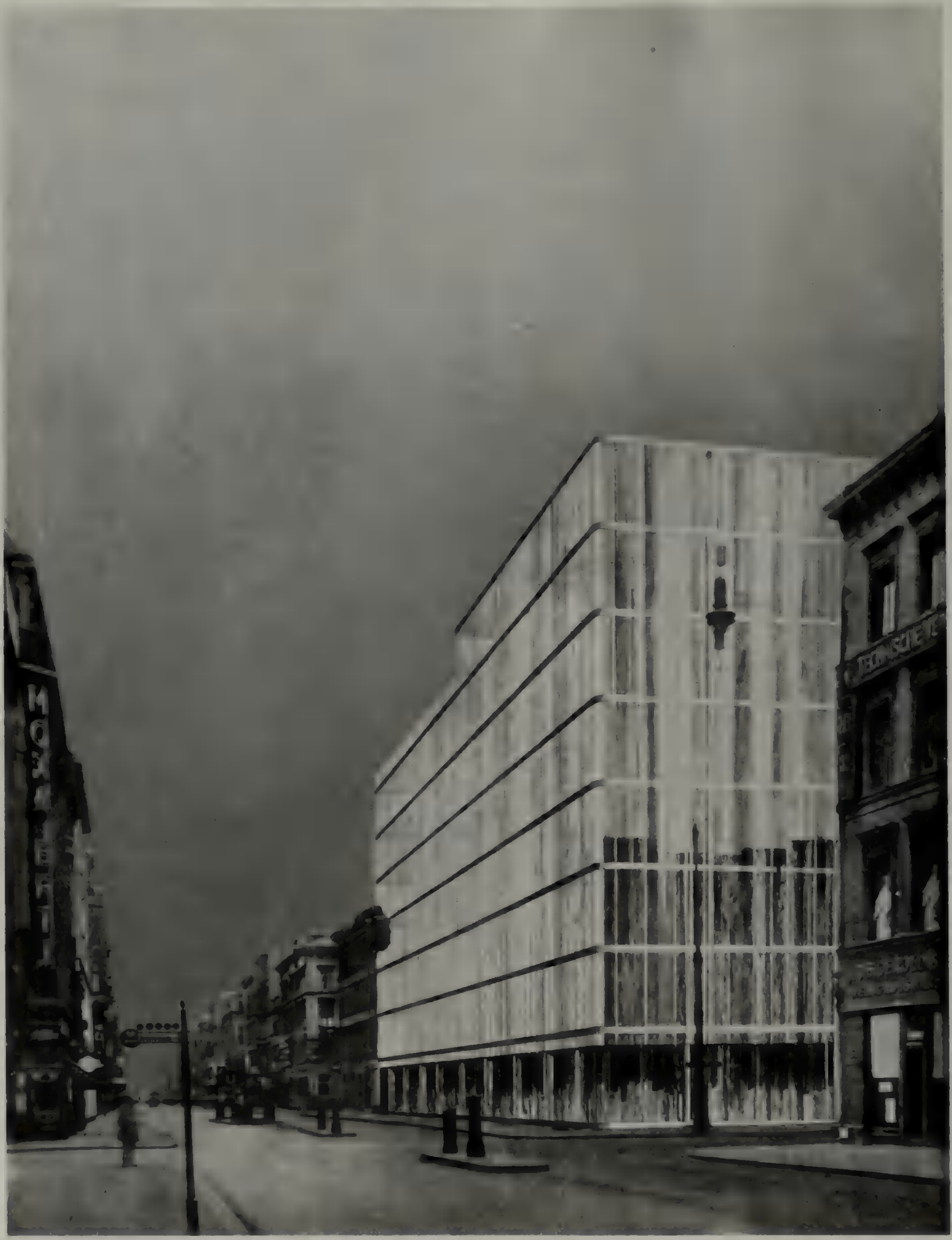


Vertical obstructions become architectural features. Tons of masonry piled on shelfangles defy the very purpose of the zoning law by shutting out the daylight. The achievements of the engineer neutralized by the designer.



DESIGN FOR OFFICE BUILDING, CHICAGO, WERNER M. MOSER, ARCHITECT

The cantilevered steel construction permits continuous openings for light and vision and a controlled flexible layout of the office units. The elevator shafts, enclosed in steel and wired glass construction, and the service units are separated from the office part. The building is easily read. Separate functions are separated in space, material and construction, permitting a rational solution of each individual problem.



DESIGN FOR DEPARTMENT STORE, BERLIN
MIES VAN DER ROHE, ARCHITECT

No excess load. A curtain of metal and glass hung from floor to floor.

TECHNICAL NEWS AND RESEARCH

NEWSPAPERS AND PUBLISHING PLANTS

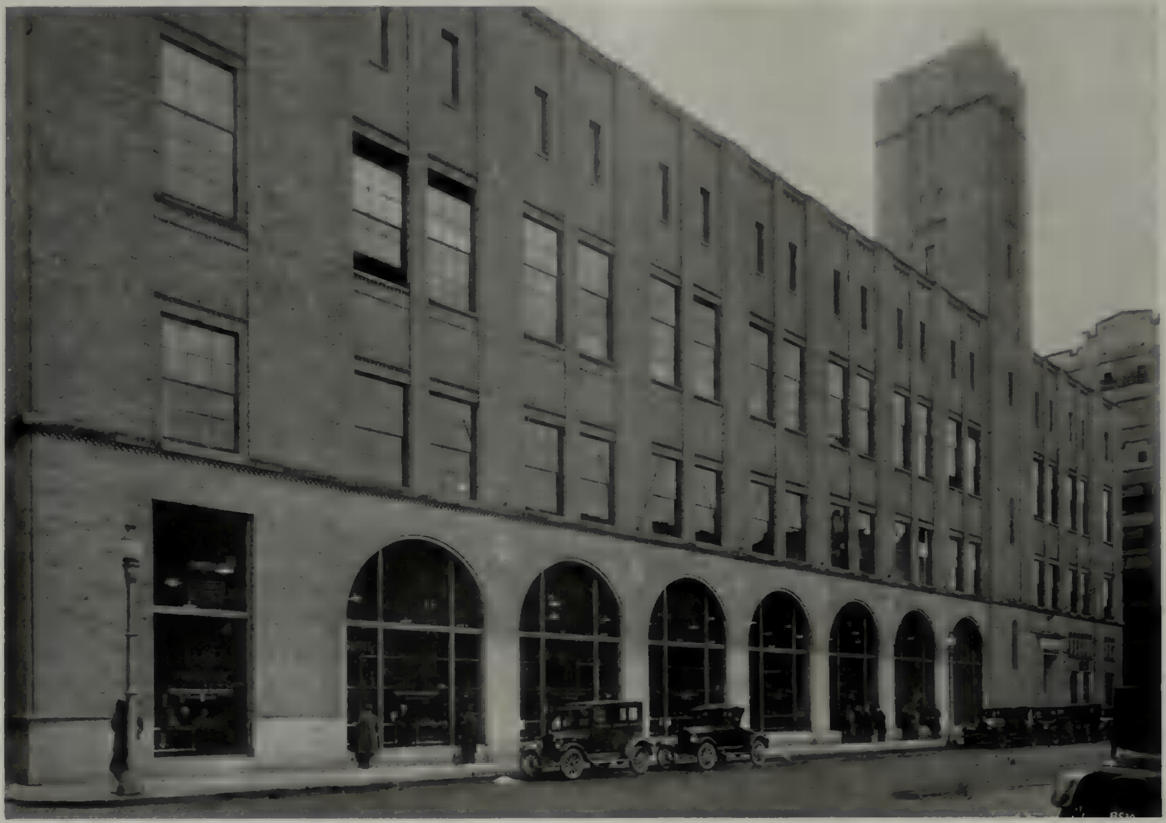
BY

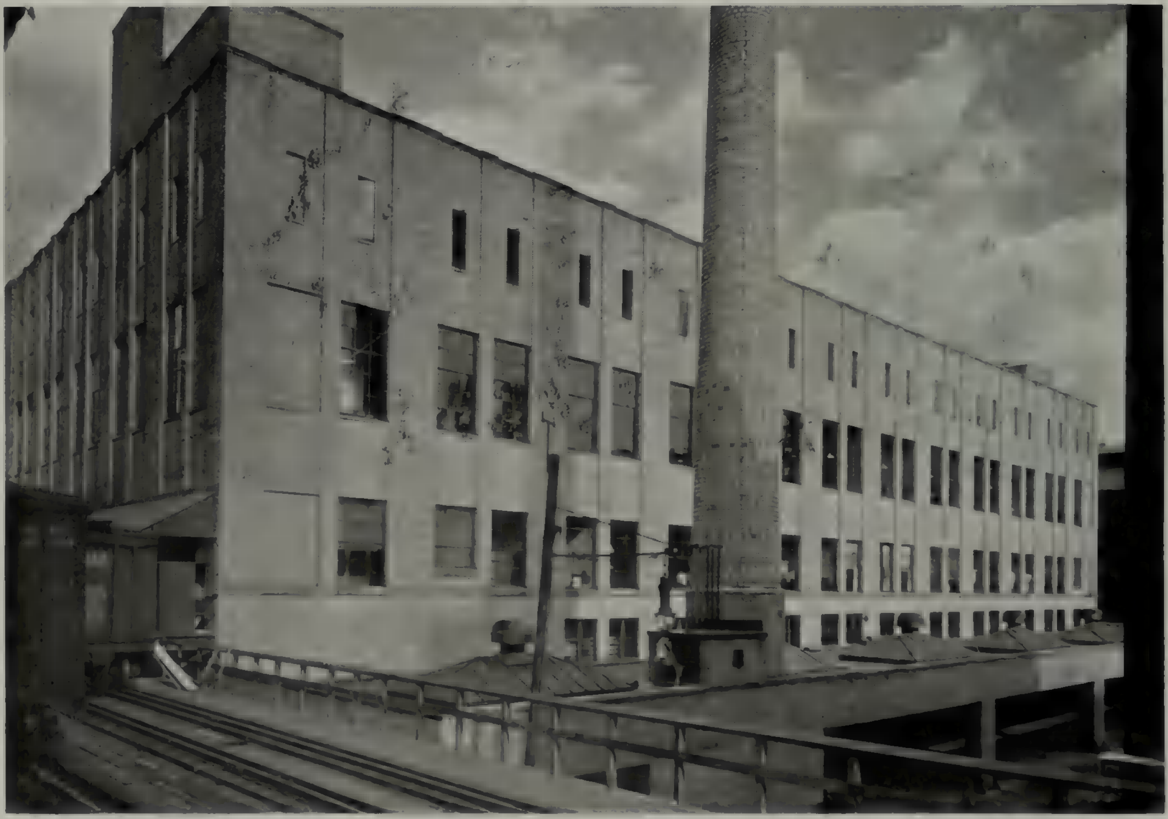
C. THEODORE LARSON

Anderson

KANSAS CITY STAR • CITY ROOM, NUCLEUS OF THE NEWSPAPER PLANT

Many architects, engineers, editors, publishers and craftsmen have been consulted in the preparation of this article. Appreciation is expressed for their assistance and in particular for valuable data contributed by Frank D. Chase, Inc., engineers and architects; Lockwood Greene Engineers, Inc.; Laurance B. Siegfried, editor The American Printer; James William Thomas, architect; and Samuel P. Weston, newspaper consultant. Others who have assisted include Bonsack and Pearce, architects; Samuel Hannaford and Sons, architects; Milton F. Baldwin, editor The Inland Printer; George H. Carter, Public Printer of the United States; E. P. Hulse, A. S. M. E., Printing Industries Division; F. M. Feiker, Associated Business Papers; F. J. Kaysel; William Edwin Rudge; and several score newspapers and publishing concerns throughout the country.





PITTSBURGH PRESS, HOWELL AND THOMAS, ARCHITECTS

The element of time determines the value of the newspaper site. Traffic movements and population distribution must be considered for speedy delivery. A railroad siding expedites the receiving of paper and other materials.

PUBLISHING PLANTS:

NEWSPAPERS AND PRINTING PLANTS

The publishing plant commands attention as an economically important and technically complicated building type. The printing industry ranks fourth in American manufacturing in value of products and sixth in number of wage-earners employed.* Satisfactory accommodations for the workmen and direct planning are imperative needs.

No attempt is made in this article to list the space requirements of personnel or equipment since these vary with each plant and are always changing. Plants themselves show changes in nature of product. Printing of daily newspapers in color is heralded for the very near future. A recent magazine article notes that there is a reading machine in Germany which picks up the reflected light from the page and translates the image into sounds. It is now used as an aid to the blind, but the prediction is made that before 1940 we, too, may be listening to it as it mumbles the morning paper.

In view of rapid changes in contemporary printing methods, it is clear that a study of this building type, to have any permanent value, must concern *fundamental* factors. *The problem of the publishing plant is not to make the plant fit a building but to construct a building to fit the requirements, general as well as specific.*

CLASSIFICATIONS

Publishing plants have three classifications, based on the determinants of character of product and the element of time:

1. Newspapers

The function of the newspaper is to supply news to the community. News is a vendible commodity—information. Information comprises many facts: *immediate happenings*, such as political and governmental activity, catastrophes, market reports, sports, social events, and *educational features*, ranging from editorials and advice to the lovelorn to a miscellany of popular interest articles. Advertisements are also information.

In furnishing information to the community, the element of time is a primary consideration. News is perishable: it must be obtained and passed on to the consumer, the reader, as rapidly as possible. A premium is placed on speed of production. The newspaper which prints the news of an event ahead of its competitors is judged successful: it enjoys the monopoly of the "scoop."

This emphasis on rapidity of output has made newspapers extremely efficient and complex organizations. The plants in general are better planned and more elaborately equipped that ordinary printshops. In the attempt to reduce the time element to a minimum, the radio has become an important addition to many plants. The radio however has a serious drawback—it retains no record of the news. A speech may be broadcast but unless the following editions carry a transcript of it in printed page form it will be lost to those who were unable to dial in on the audition.

The educational relationship of the newspaper to the community likewise shows in the planning of the building. Educational facilities are sometimes provided: weather bureau, geographical studies, auditorium, display rooms for art exhibits, flower shows, model home furnishings, domestic science laboratories, and the like. Business offices, usually those of advertising companies, are often conveniently located in the same building with the newspaper for the advantages offered. The newspaper is more than *vox populi:* in its role of education it assumes civic leadership. Many cities and towns have grown from the editorial campaigns for political reform, good roads and better housing. As an impartial critic the newspaper is—or should be—a moving force for community planning.

2. Book and magazine publishing plants

These also furnish the desired commodity of information to the community in the form of printed matter. The product is uniform. Magazines or books are mechanically alike in successive editions so that equipment and routine in general are easily standardized. Less emphasis is on the time element. Magazines appear at stated intervals but sufficiently separated so that there is no urgent haste for rapid publication. Books are usually scheduled for seasonal publication; speed of production is not imperative although it may indicate efficient and economical operation of the plant.

3. Job printing plants

These show no uniformity of product. Each job is unlike the others. Diversification of equipment is necessary to accommodate the varied printing needs. The time element is imperative. Business reasons usually demand rapid production of each job, and time is profit. In newspapers, however, time is more than profit, it is part of the commodity itself.

Not infrequently these three types of publishing plants are found combined in a single establishment. The printer in a small town may be printing the local paper as well as miscellaneous items and a few house organs, or a large metropolitan daily may find it profitable and convenient to run a job printing department together with its other activities.

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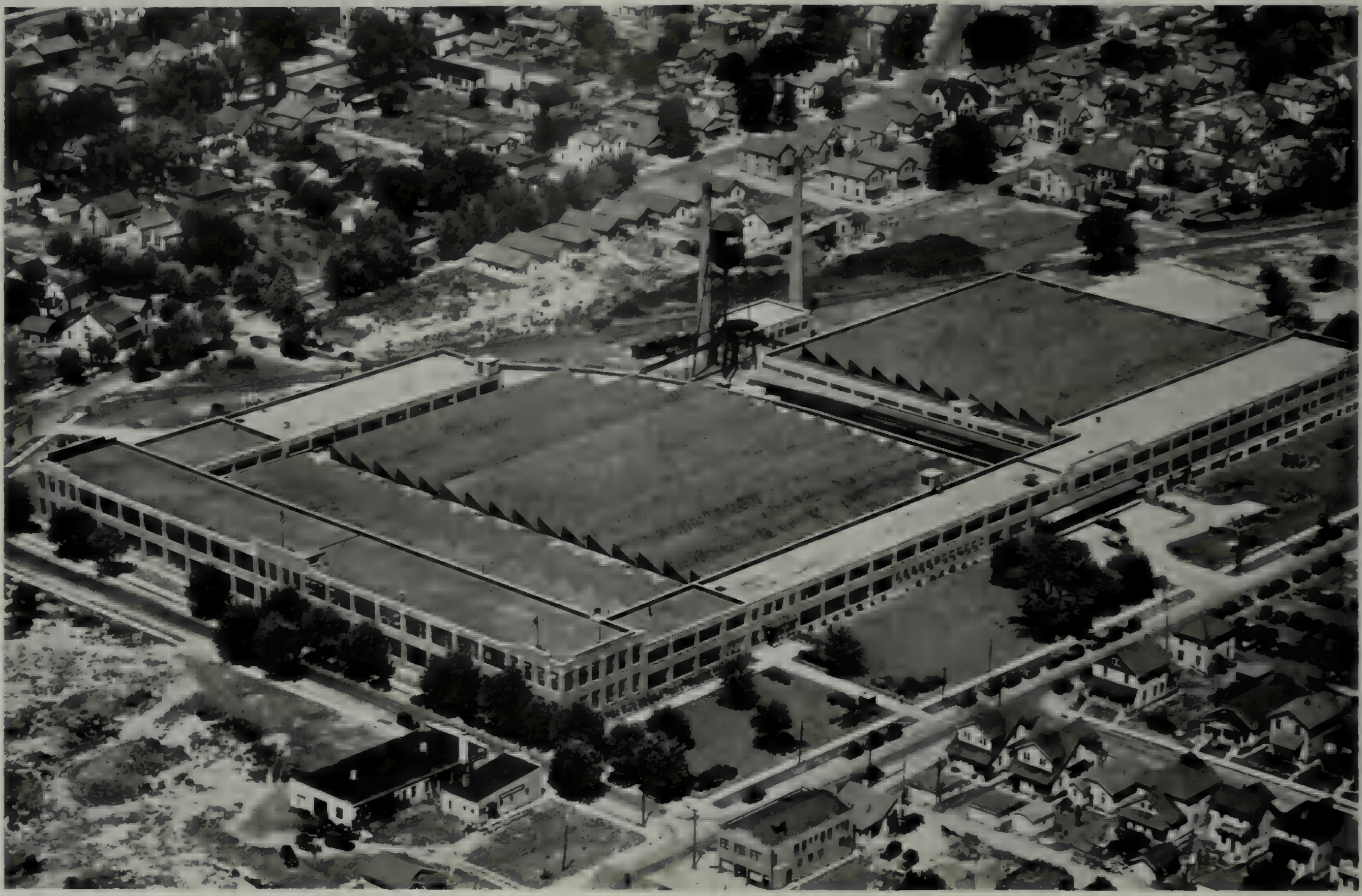
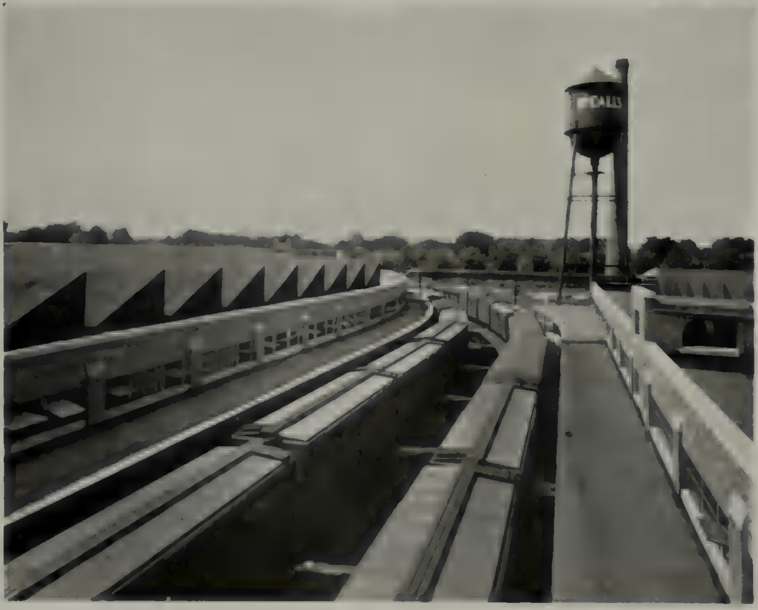
* Biennial Census of Manufacturers, 1927. U. S. Dept. of Commerce, Bureau of the Census.



Mayfield Aerial Survey

This site meets favorably the distribution requirements of the McCall company. It is the center of a large paper manufacturing district and offers a supply of higher class labor. Both railroad and trucking facilities are afforded. Printing operations are easily conducted on the ground floor. The plant, several times expanded, consists of two manufacturing units, magazines and patterns, separated by railroad sidings.



Railroad sidings for receiving and shipping. At left, the printing unit. At right, pattern unit. The two platforms are cross-connected at south end of building.

McCALL PUBLISHING PLANT
DAYTON, OHIO
LOCKWOOD GREENE ENGINEERS, INC.

RELATION OF COMMUNITY TO PLANT

Choice of site depends largely on the type of plant and the community it touches in the manufacture and distribution of its product.

The time element determines the value of the site for the newspaper. Traffic movements and distribution of population must be considered. What gain is there in clipping a few minutes off the production schedule if a half hour is lost by the delivery trucks in bucking adverse traffic congestion which could have been obviated by a more suitable location? Nor should a plant be placed so far from its class of readers that a disproportionate amount of time is required for the product to reach them. Several New York and Chicago papers have found it necessary to build branch plants in order to more conveniently and rapidly distribute the editions to certain localities.

A study of *community movements* is also essential. Samuel P. Weston, newspaper consultant, suggests that planning of the newspaper plant should begin with a study of the needs of the delivery and mailing rooms. Trucks should be able to swing out into—not against—the flow of traffic. Nor should trucking space be so allotted that it interferes with pedestrian traffic on the sidewalks. A site which fronts on several streets or alleys allows advantageous disposition of trucking space as well as good daylight.

Future trends should be discerned. Present traffic flow and distribution of population do not suffice alone. The growth of the newspaper parallels that of the community which it serves, and for this reason it is advisable to obtain a site which will be in the line of growth of the city.

For the job printer or book publisher the site determinants are not so rigid, chiefly because of the difference in the time element. Plants are found in business sections, others in thinly settled suburban districts. Frequently the business and editorial offices may be in one locality and the printing plant in another. Proximity to customers and to labor supply is desirable. In the case of book and magazine publishers, where the product is shipped to all parts of the country, the main determinant is accessibility to sources of material and to shipping facilities. The job printer must be near his labor and sales markets. Frequently the site is selected for its low cost or rental, or for its advertising prominence: several printing establishments along the heavily travelled postroad from New York to Boston have found the location advantageous not only for trucking but also for its publicity value.

Available facilities should be considered. Paper and ink supplies usually are shipped by rail. A railroad siding expedites the receiving of materials and the shipping of the printed product. In the Chicago *Daily News* the paper rolls can be easily shipped by either rail or barge; air rights allow the building to rise over the terminal tracks, and express trains can pick up the mail editions and carry the papers rapidly to distant subscribers; from barges on the Chicago River the paper rolls are tunneled under the railroad tracks and thence by lifts into storage space in the building.

Since many plants suffer from rapid growth and consequent overcrowding, ample space should be allowed for future expansion. Many printers like a location outside the city where the cheaper land rates allow plants to expand without difficulty and also to carry on all the printing processes on the ground floor with overhead daylight illumination. Where several floors are required, vertical trucking of plates and paper becomes necessary and the mechanical difficulties of straight line production are increased. Sunlight and healthful living conditions are more easily obtained outside the large cities than in the congested districts.

In recent years there has been a tendency to group together in a single building and in a desirable locality a number of printing concerns and allied businesses. Such are the Printing Crafts Building, the Graphic Arts Center and the Master Printers' Building, all in New York City. The Printing Crafts Building, on Eighth Avenue at Thirty-third Street, houses paper and printing equipment companies as well as printing, engraving companies and binderies. Nearby are the Pennsylvania station and general post office so that outgoing mail deliveries are easily trucked by hand to the trains.

FUNCTIONS

Publishing plants comprise the following operations, in varying combinations:

1. The gathering and preparation of news or editorial matter, including advertisements and illustrations.

2. The mechanical processes of turning the photographs, drawings and art work into readiness for the desired printing.

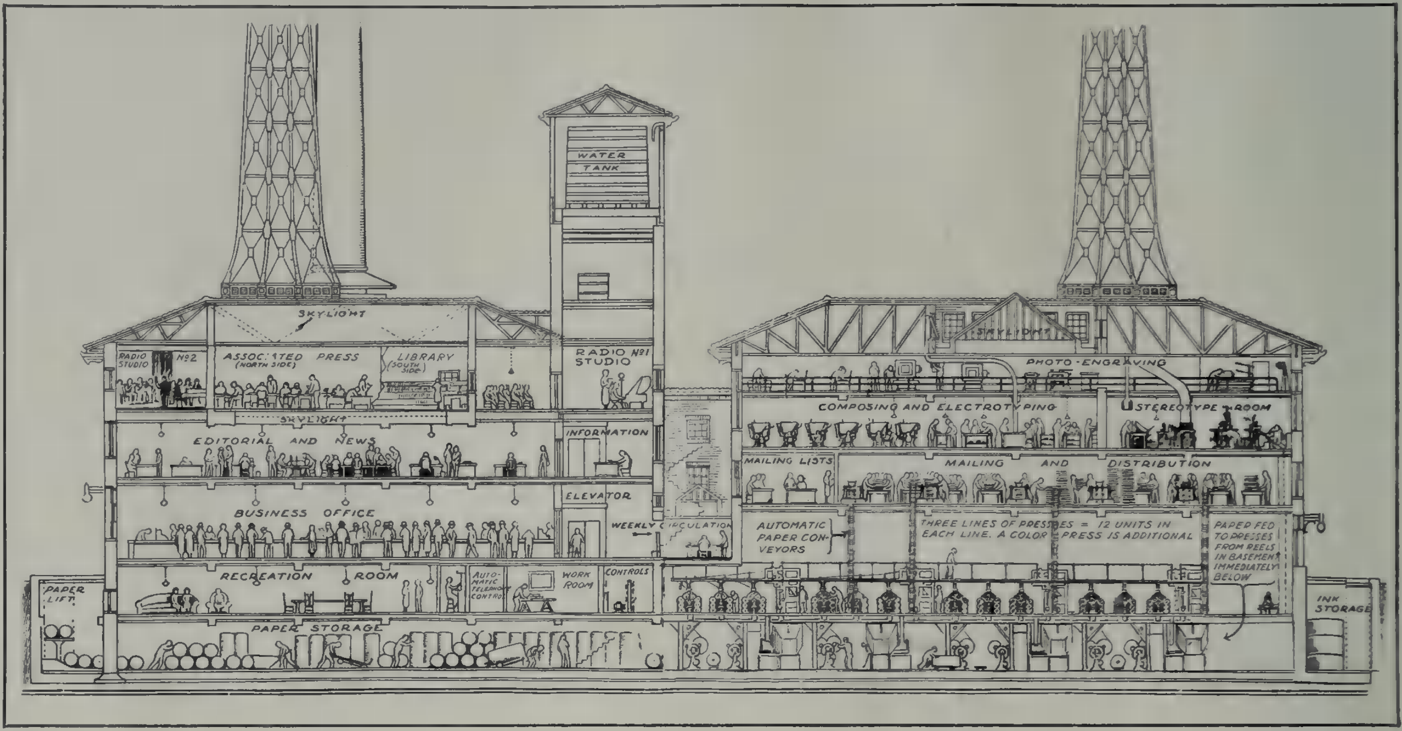
3. The composition in type of the word-matter, blocking into pages, imposing and locking up for printing.

4. The mechanical processes of printing.

5. The folding, binding, and distribution of the printed product according to circulation requirements.

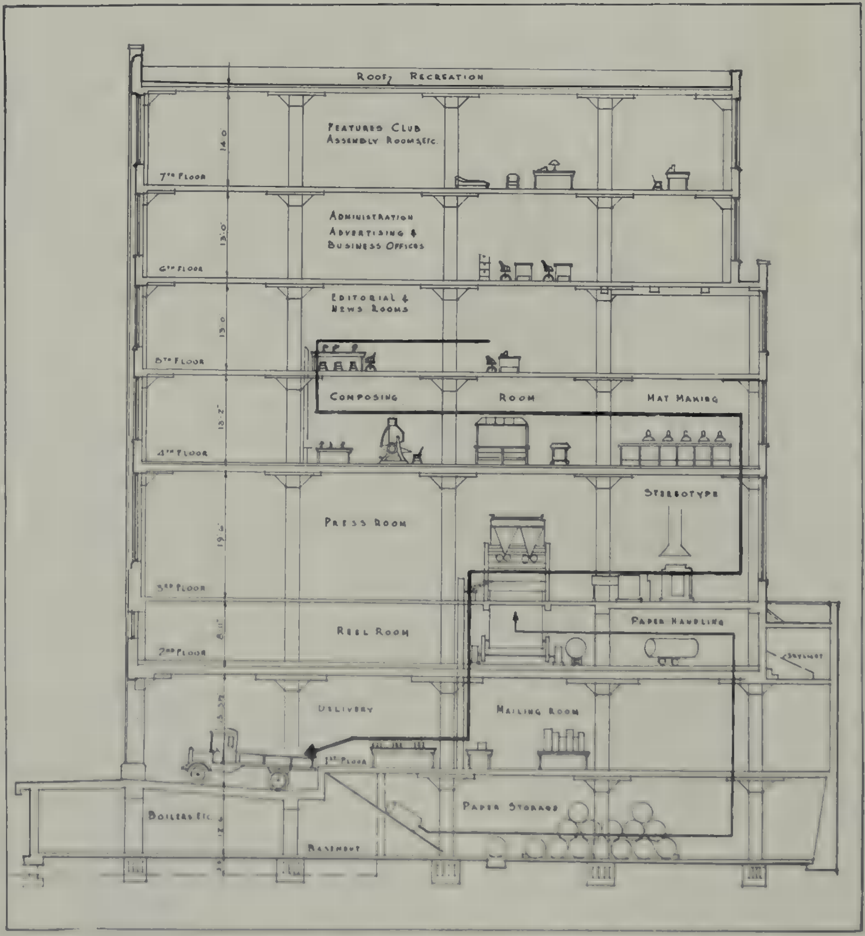
A publishing plant may comprise any or all of these functions. A newspaper performs all these operations under one roof, or in the case of a branch plant, the printing processes may be carried on elsewhere separately. A magazine may be edited in one building, the illustrations engraved in another, the text set up and printed in a third, and the editions bound and distributed through a fourth agency.

PLANT INTEGRATION

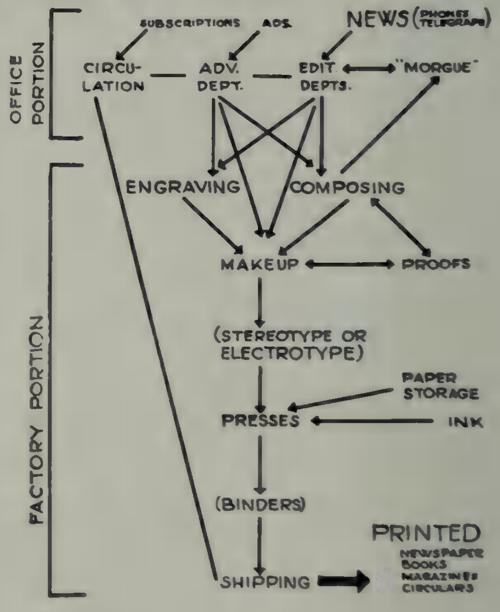


THE KANSAS CITY STAR

Separation of office and factory units.



CO-ORDINATION OF DEPARTMENTS



NEW YORK TRIBUNE

Gravity principle of straight-line production.

PLANNING

Fundamentally, publishing is a combination of a business and a profession. The professional side partakes of the same needs for design and construction as are found in the professional offices of architects, bankers, advertising agents and similar groups. The printing side calls for factory requirements. The present tendency is to separate the two units where possible, although the McGraw-Hill Company, in planning a new building, has decided to key together the plant and publishing offices as a unit. Whether separated or not, it seems essential to integrate the professional and mechanical elements in terms of intercommunication systems and executive control.

1. Straight-line production is essential, both for economy of time and for efficiency of operation. This is especially true for newspaper planning. "Flow sheet" data should be compiled and studied so that back-tracking of operations will be reduced to a minimum. Many job printers who have built recently have found it desirable to place all operations on one floor. This eliminates carting materials and copy vertically from floor to floor.

Obviously, where realty values are high the building must go up several stories and it becomes necessary to superimpose the various printing operations. Belt and vertical conveyors, automatic lifts and elevators facilitate the transition between production processes. In recent years, the *gravity theory* of straight-line production, first developed by S. P. Weston in the New York *Tribune*, has come into increasing favor. With this arrangement, initial operations are placed on the upper floors and the production continues downward until the printed sheets emerge in the mailing rooms on the lowest level where they are forthwith shipped away by truck or train.

Frequently examples are found where a sharp distinction is drawn between the office portions and the factory portion of plants. This is done usually because the mechanical equipment requires a different type of construction than that of the general offices.

2. Department co-ordination is necessary for straight-line production. Each department of a newspaper has a direct relation to all other departments: each contributes toward the finished product but does not by itself complete the product. It is of utmost importance that the product be delivered from one department to the next in each step of the process with maximum dispatch and efficiency for the plant to function economically and expeditiously as a whole.

3. Future expansion should be foreseen. In many older plants efficient operation as well as satisfactory working conditions have been impaired by overcrowding of equipment owing to the rapid growth of the business. In view of constantly changing mechanical equipment, a flexible plan is demanded, one which allows expansion of certain departments without detracting from the efficiency of other departments. Radical changes in equipment should be anticipated so that there will be no necessity to change the construction of the building.

Freedom from partitions, where possible, not only economizes space, facilitates handling between departments and permits an unbroken survey of operations, but it also makes easier any changes due to replacement of machinery or to expansion. However, in many instances, partitions are necessary to shut off heat, dust, vapor or noise.

Where the plant is entirely on one floor and the ground site is large, it is comparatively easy to make new additions or alterations. Proper spacing of columns is necessary for the installation of equipment. A minimum of columns makes easier any changes in planning due to new equipment. For a ground floor plant, light-weight roof construction is desirable since the number of columns required is reduced.

4. Physical comfort and good health of employees are necessary conditions for any satisfactory plant operation. In a health survey of the printing trades, 1922-25,* undertaken by Frederick L. Hoffman, LL.D., it was discovered that while accidents are a potential danger, they are relatively rare. The three prevailing forms of sickness were found to be:

a. *Lead poisoning.* This is of minor importance now. The report shows that this ailment varies with the various processes, ranging from 0.3 per 1000 for pressmen to 3.5 per 1000 for stereotypers at the time the study was made. This is a notable decrease from conditions of the preceding decades when low wages, long hours, dust, fumes from the lead pots, and poor ventilation and light were customary.

b. *Tuberculosis.* This is also on the decline owing to recognition of the need for better working conditions. Until forced ventilation was provided, workmen were obliged to breathe dust-laden air and the fumes from nitric and other acids which they were handling.

c. *Eye infections.* These remain the most pressing need. Fine printing and certain mechanical operations, such as routing and finishing of engravings, place a severe strain on the eyes. Until the mechanism becomes developed so that human labor is not needed for these operations, efforts should be made to alleviate eye strain and infections as much as possible. Certain precautions can be observed. Men should *not* be forced to wash up in sinks used for handling vitriol or other acids. Nor should smoke and fumes from the stereotype room be allowed to escape into the composing room or the pressroom.

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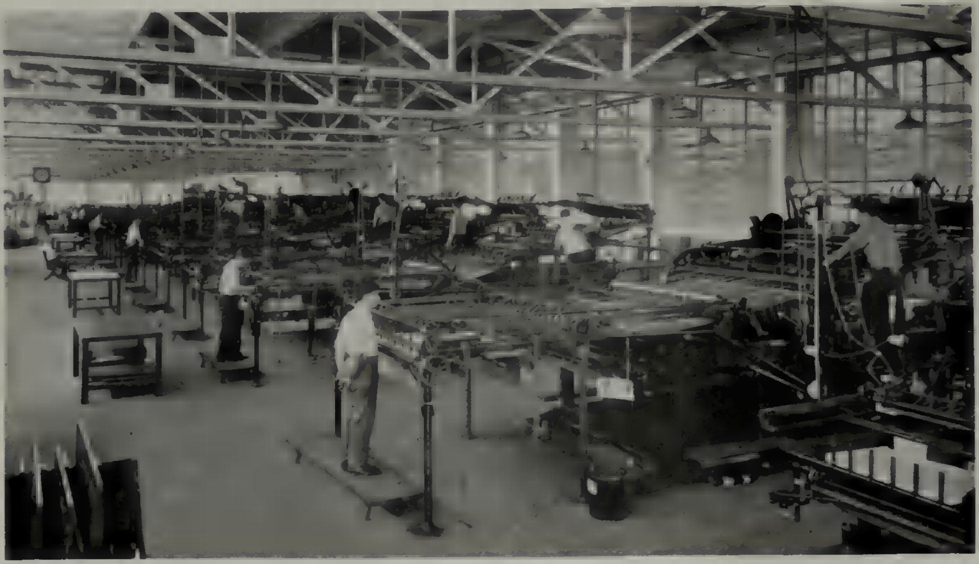
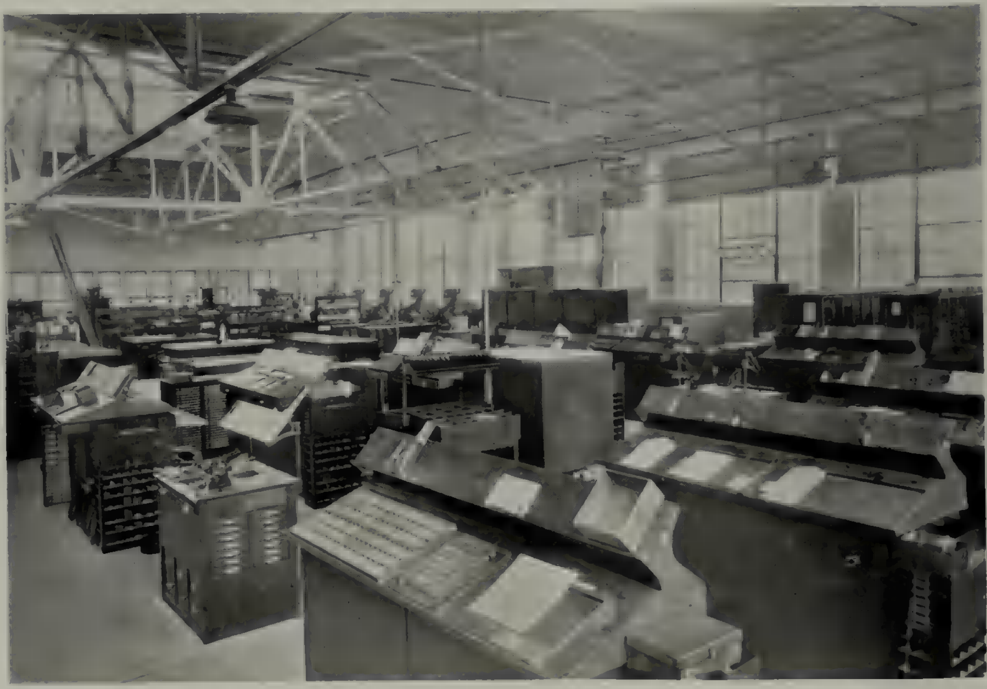
*U. S. Department of Labor, Bulletin No. 427



PRESSES

Ample daylight illumination is provided for all the mechanical operations.

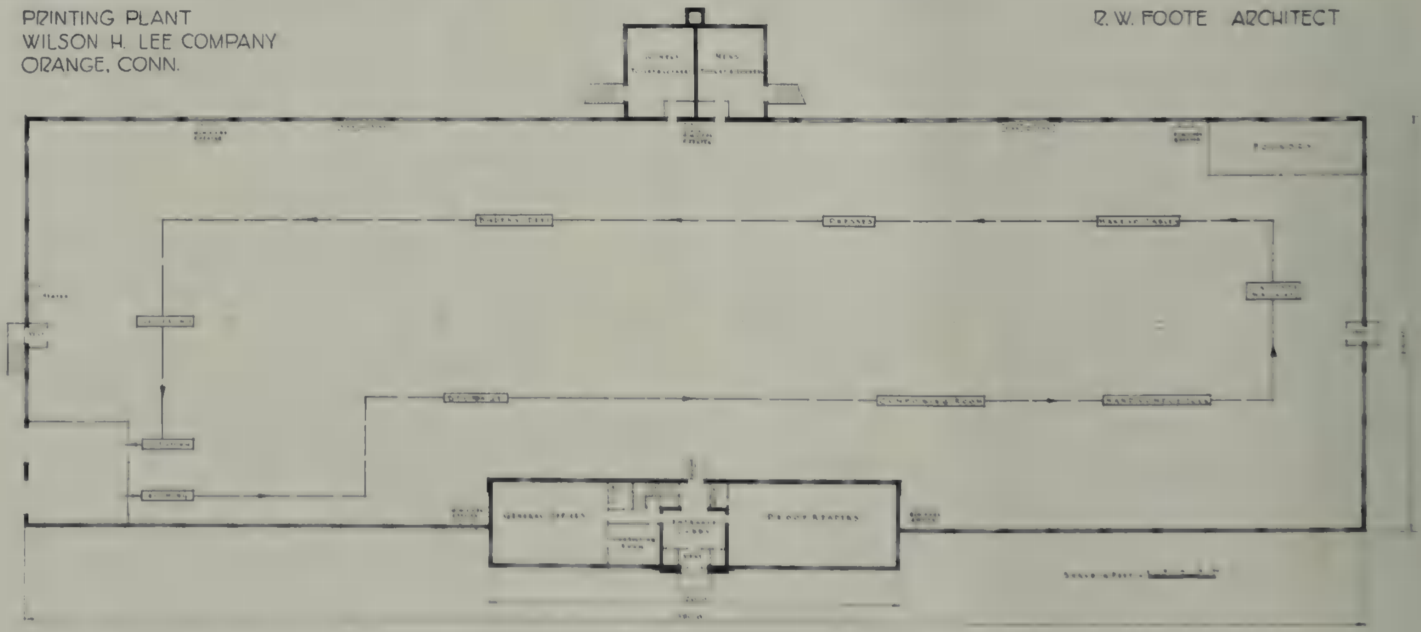


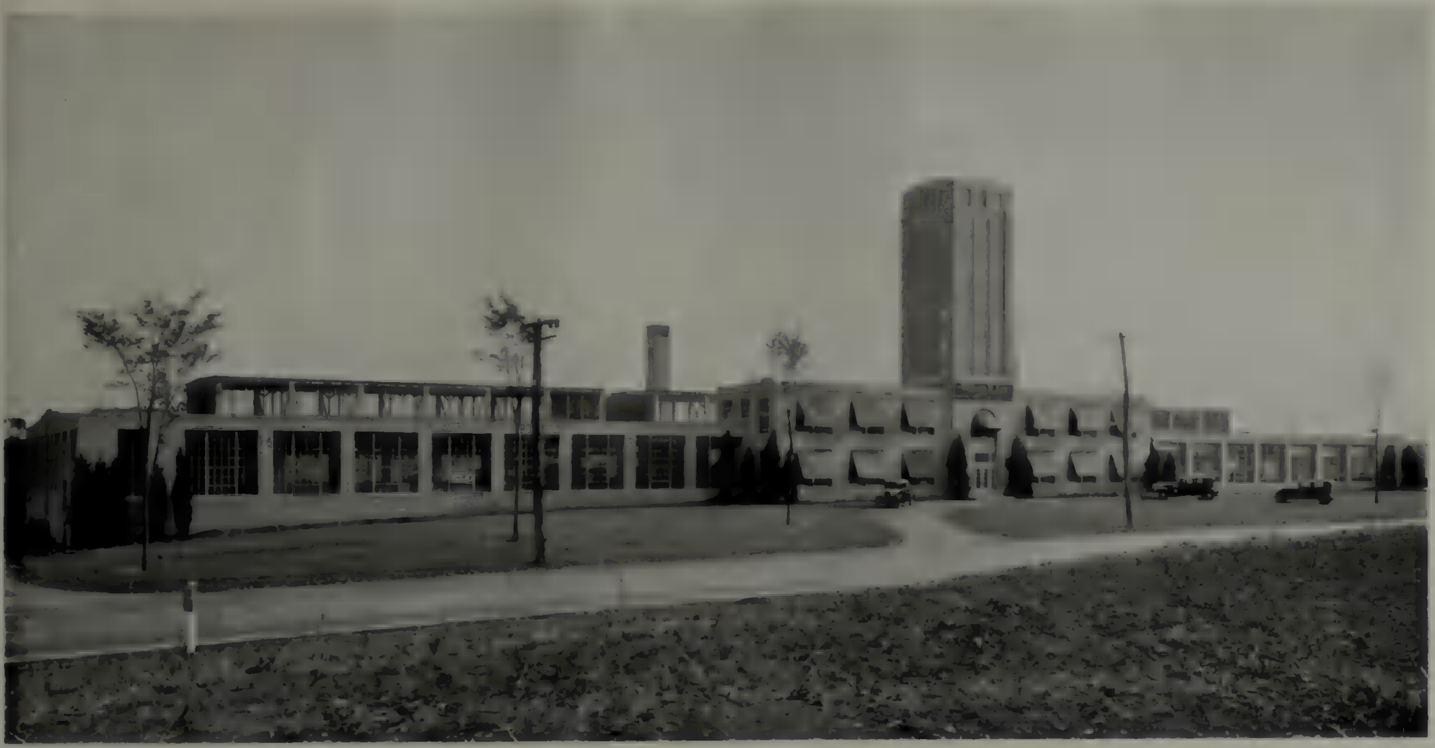
COMPOSITION BANKS

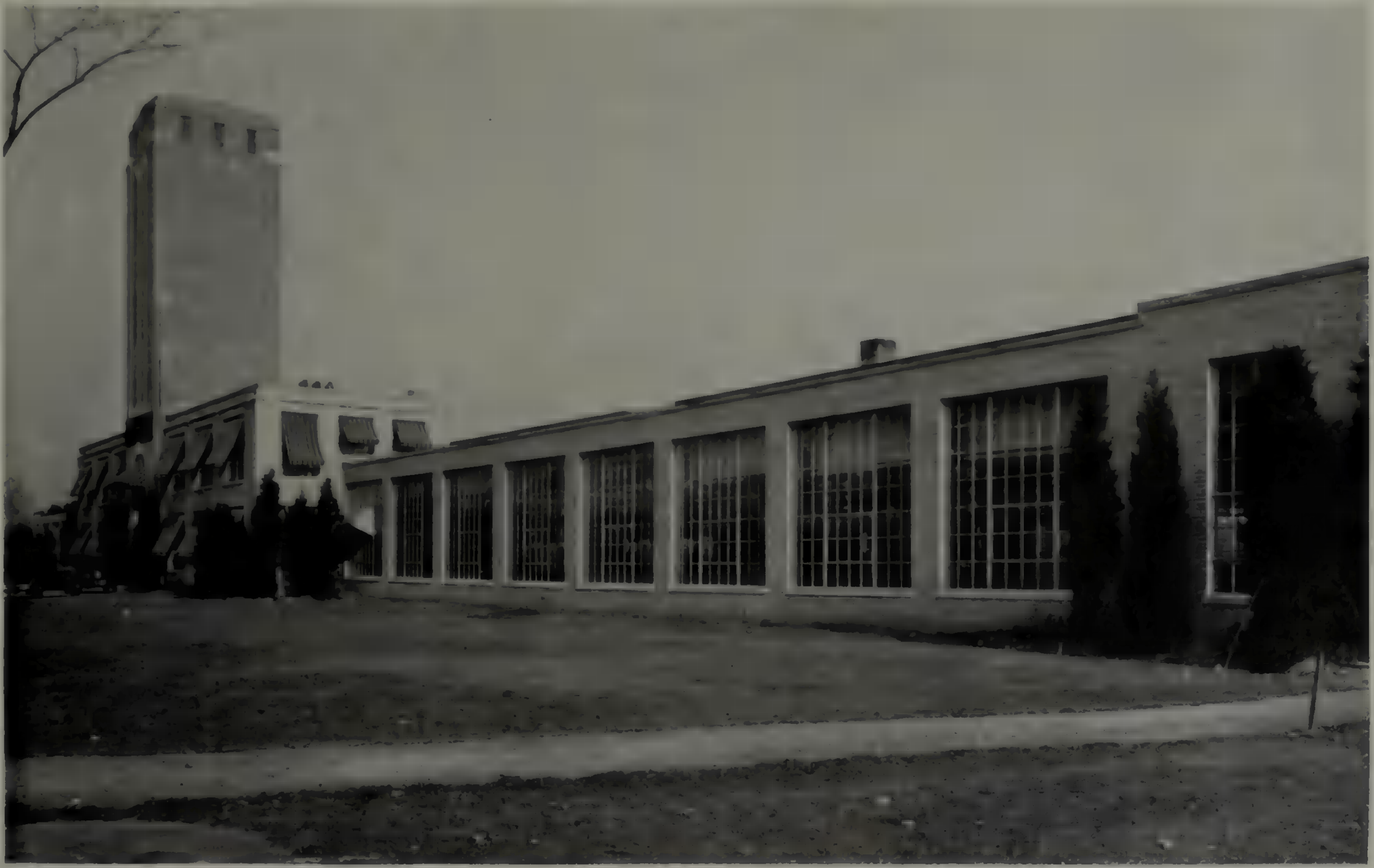
At far corner of room is the foundry, isolated by partitions to shut off gases and fumes.

PRINTING PLANT
WILSON H. LEE COMPANY
ORANGE, CONN.

R. W. FOOTE ARCHITECT

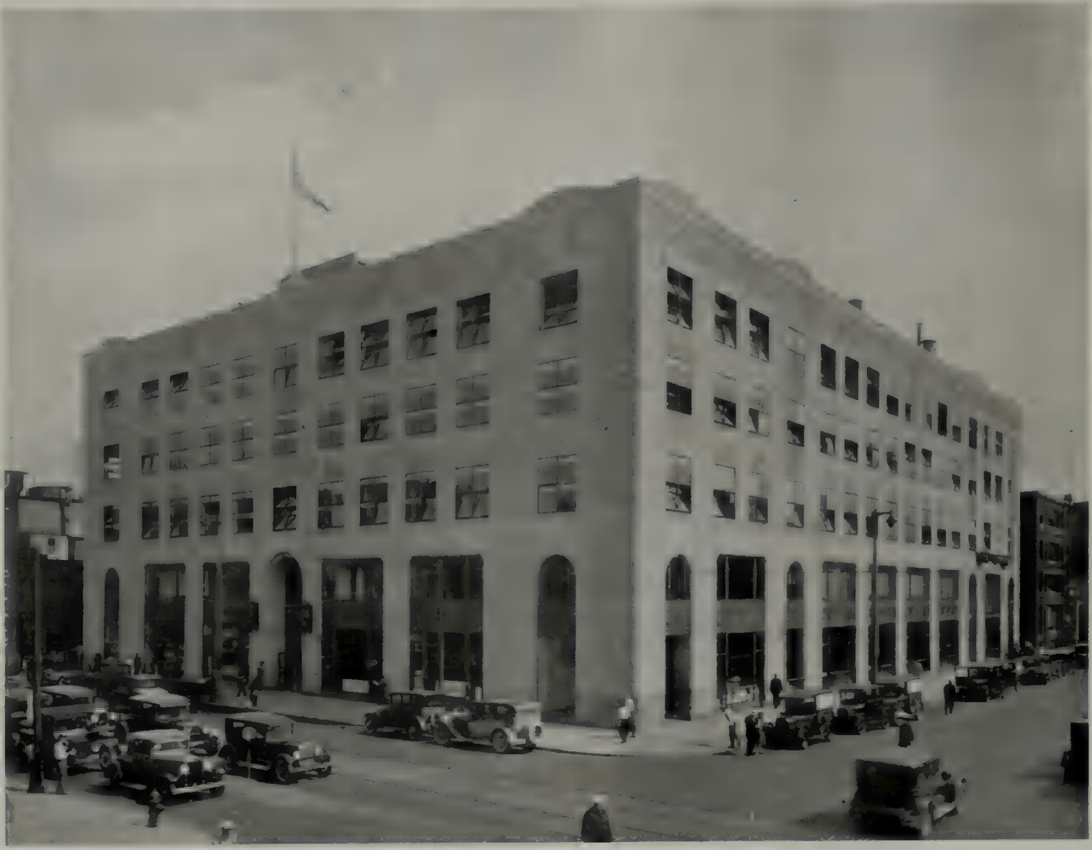




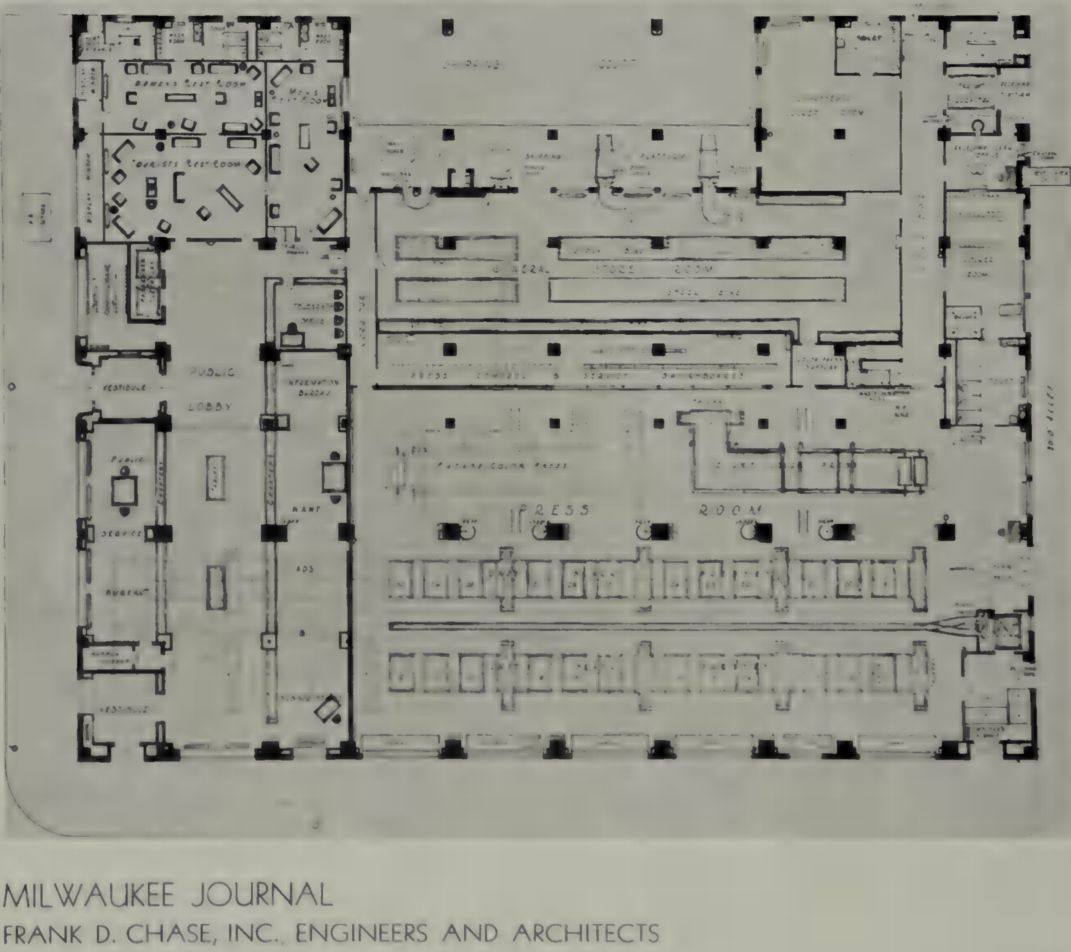


WILSON H. LEE PRINTING PLANT
ORANGE, CONNECTICUT
R. W. FOOTE, ARCHITECT

With all operations on the ground floor, straight-line production is achieved. Plant can be easily expanded.



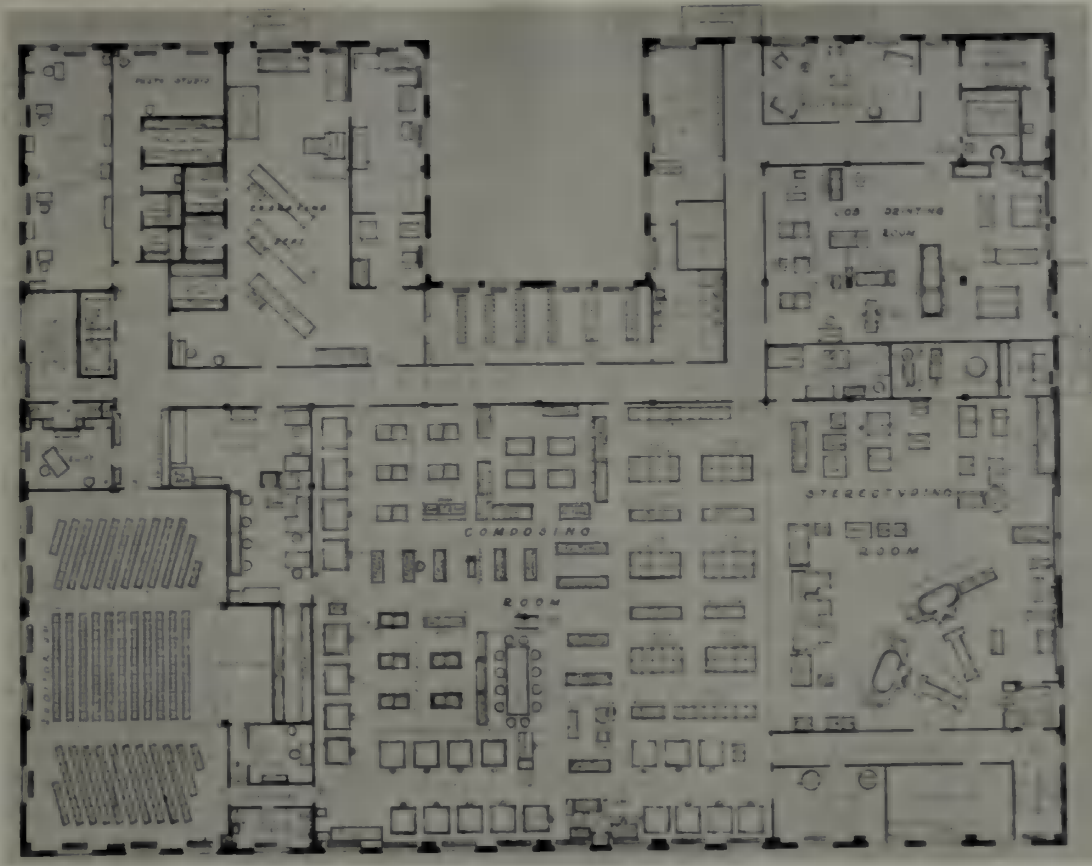
Presses can be seen from street level, an advertising feature.



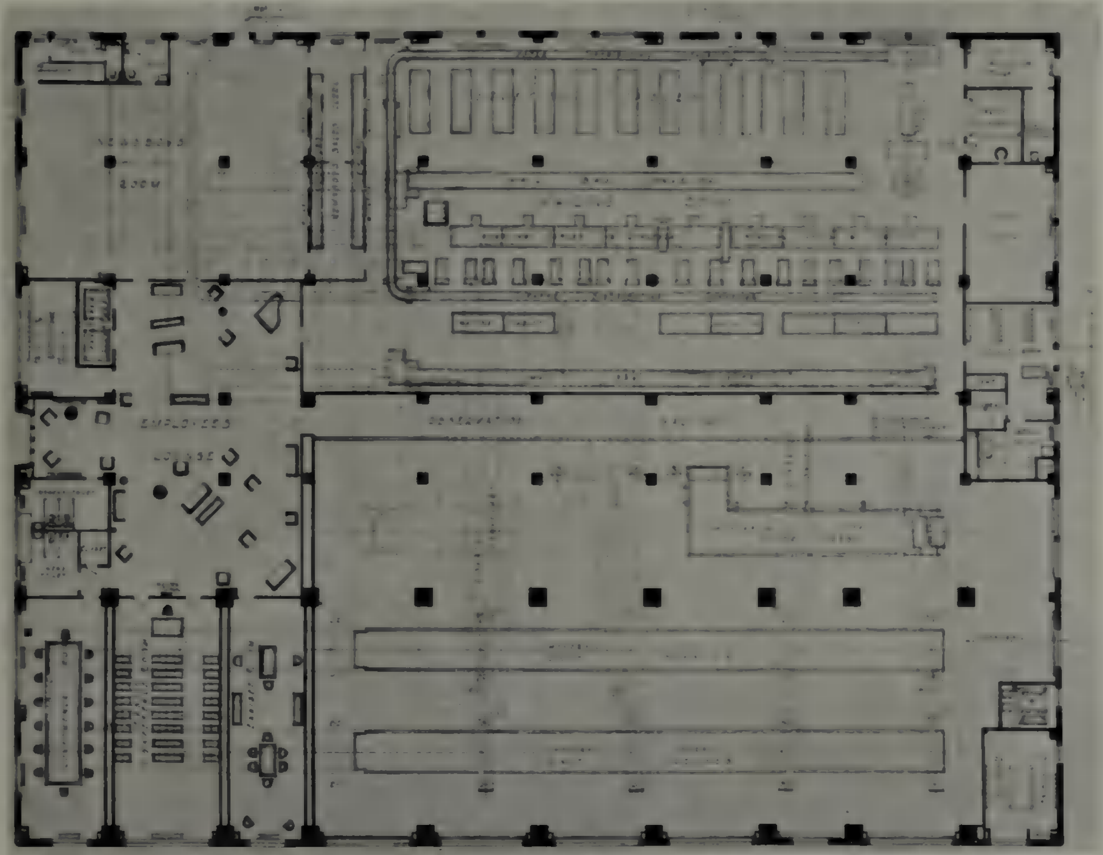
Ground floor plan illustrates division between office and factory units.

MILWAUKEE JOURNAL

FRANK D. CHASE, INC., ENGINEERS AND ARCHITECTS

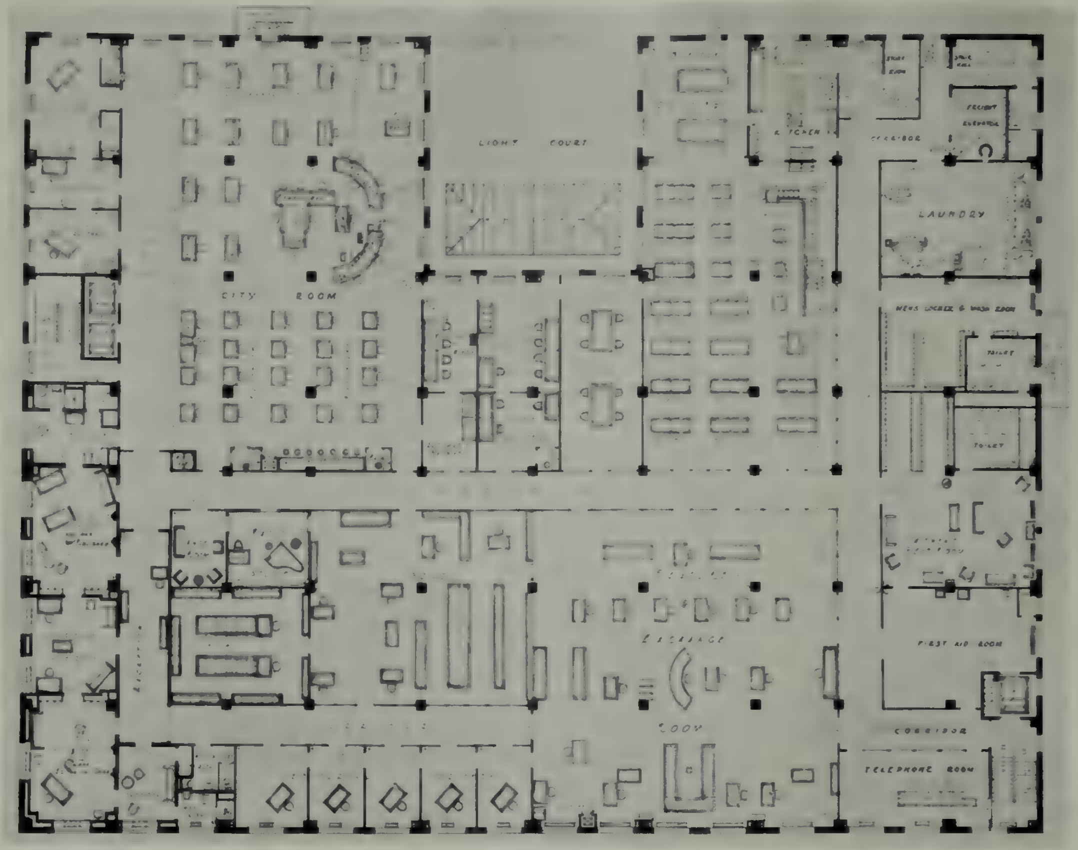


Composing, engraving and stereotyping rooms occupy fifth floor. Auditorium utilizes space allotted for future expansion.

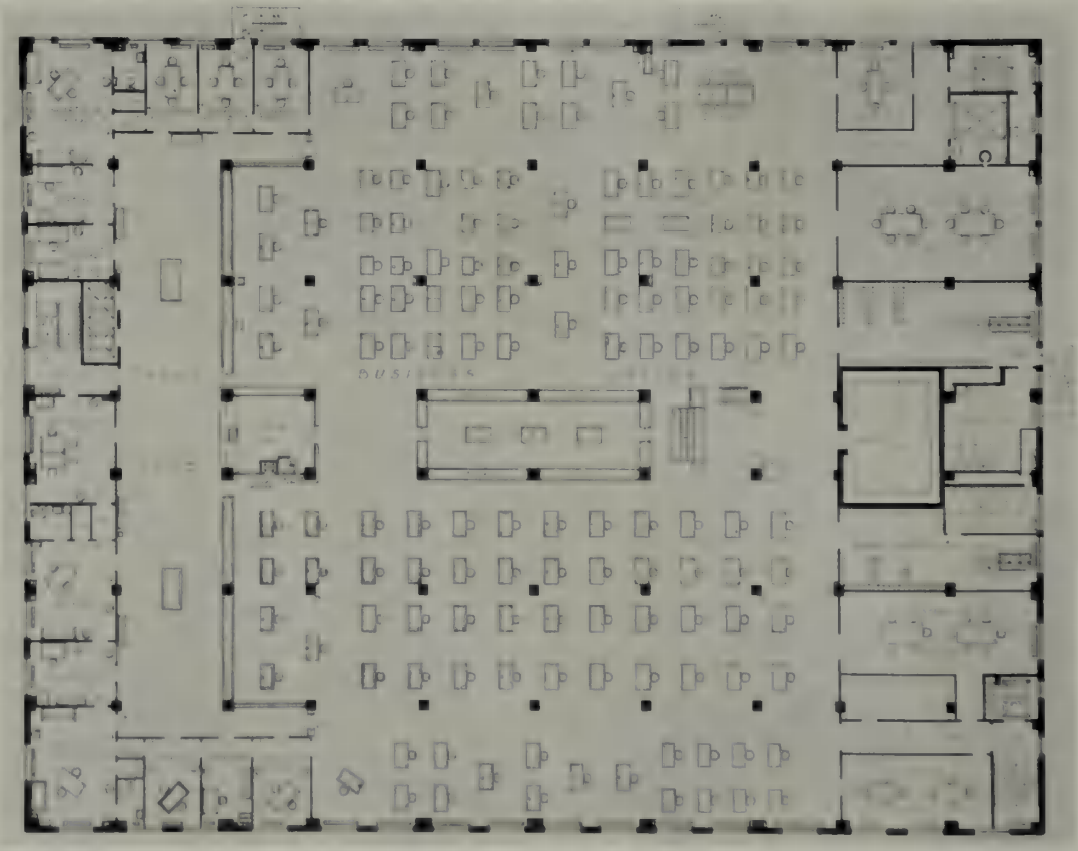


Conveyors carry papers from presses to mailing room on second floor. Chutes deliver bundles to loading platforms below.

MILWAUKEE JOURNAL
FRANK D. CHASE, INC., ENGINEERS AND ARCHITECTS



Editorial rooms are on fourth floor. Separate offices for editors and editorial writers. City room as one large unit.



Business offices are on third floor, accessible to public.

MILWAUKEE JOURNAL
FRANK D. CHASE, INC., ENGINEERS AND ARCHITECTS

CHECK LIST OF REQUIREMENTS

EDITORIAL ROOMS

Function: News comes in over telegraph wires or is written up by reporters to be edited and conveyed by vacuum tubes or other suitable means (which will not jamb or cause delays) to the copy desk in the composing room where it is set up in type. In a metropolitan newspaper the news is handled by many departments. The city desk is the nucleus. About it are the desks and telephones for the reporters and rewrite men. The telegraph editor and his assistants handle the news coming in from other localities. Other departments include the editorial and special feature writers, the sports, market, book, movies, theatre, Sunday, art, and photographic editors and their assistants.

Planning: The editorial department with its correlated financial, telegraph and photographing departments should be in close proximity to the composing room. Even though closely related physically, there should be mechanical arrangements for sending copy to the composing room copy desk.

Opinion differs whether the editorial offices should be kept in one large city room or broken up into smaller, separate units. The former is favored. In the New York *Times* city room the only private office is that of the managing editor. The Kansas City *Star* has every staff member, including the editors, in full view. It is important, according to George B. Longan, editor of the *Star*, that all those active in making the paper should be in close contact with all the others. A private office is available, he adds, but it is not used since it would shut him off from close knowledge of everything that is going on. R. L. Duffus, another journalist, also states that the newspaper office should be as open as possible, without any suggestion of the cloister: "The reporters and the editors ought to be able to sense the outer world, even though an effort is made to keep as many of its noises as possible away from them."

Lighting: Uniform intensity for office work, reading and writing. Daylight desirable, without glare of direct sunlight. In this respect the needs of a morning newspaper, whose busiest hours are after dark, differ from those of an afternoon paper.

Heating: Comfortably moderate for physically inactive occupants.

Ventilation: Fresh air supply, particularly to telephone booths.

Soundproofing: With an open city room it is obviously necessary to reduce noise of typewriters, telephones and conversation, and to minimize distracting influences.

Telephone service: Provide network of conduit systems. Soundproof 'phone booths, 3′–6″ wide, 4′–0″ deep; 18″ shelf 27″ high for typewriter, swinging bracket seat. Additional service lines such as telegraph call boxes, local fire alarm.

Flooring: Soft, sound-absorbing, easy to clean. Linoleum over concrete preferred; wood, second choice.

TELEGRAPH SERVICE

Function: News from outside localities comes in through leased telegraph wires and services such as The Associated Press and the United Press.

Planning: Adjacent to news room and financial editor.

Lighting: Similar to editorial room requirements.

Heating, ventilation: For personal comfort.

Soundproofing: Isolate and reduce noise of telegraph instruments and automatic typewriters which are very noisy.

Wire service: Cable or trunk line service to a central outlet on instrument table. Telephones required for each telegraph service.

Conveyors: Pneumatic tubes or other suitable types needed to dispatch copy to news editors. Precautions necessary to prevent jambing and delay of copy.

Flooring: Similar to editorial room.

BUSINESS OFFICES
(ADVERTISING, CIRCULATION)

Planning: The business office contains the advertising, auditing and circulation departments. The advertising department should function closely with the ad alley in the composing room, physically and mechanically. The circulation department should function very closely with the mailing room.

Public space should be readily accessible to persons seeking to subscribe or to file advertisements. It is well to separate this space from the rest of the business offices, not only to lessen distracting influences but also to control better the inside room temperature. Planning should be for inter-departmental rather than public convenience as the major consideration, since most communication between the editorial and advertising departments and the public is done by telephone, ad solicitors or reporters.

In connection with the advertising department and the composing room ad alley, there should be a publication dispatch room in large newspapers. This dispatch room receives all ad copy and arranges entirely the advertising content of the paper.

Lighting: Illumination for clerical office work.

Heating, ventilation: For personal comfort.

Soundproofing: Necessary for telephone want-ad room, where a single error is apt to prove costly.

Flooring: Similar to editorial rooms.

Telephone service: Provide network of floor conduits.

PHOTOGRAPHY

STUDIO

Function: News can be seen as well as heard. Increasing emphasis is placed on illustrations to convey information and the news photographer has become an important personage.

Planning: Public access, especially from editorial rooms. In the new building for the New York *Daily News* the photographers occupy the editorial room in close connection with the city desk. Each photographer has his own developing room with cabinets for plates, cameras, flashlight guns and other equipment. There are 25 of these rooms arranged along the sides of a square and having access to 9 printing rooms. Doors have been left off these "dark rooms." By a clever arrangement of wall angles, exterior light is shut off completely; a flip of the switch makes the white-tiled rooms dark.

Lighting: Soft, diffused to avoid glare on subject or camera, and controlled near camera. North daylight if possible but provide electric outlets on 110-volts for 30-ampere portable lamp banks.

Heating: 75°-80° best for photographic action.

Ventilation: For comfort of occupants and cleanliness of plates and prints which are affected by dust and dirt. Windows to be fixed.

Soundproofing: Not required.

Hangings: Drapes hung on roller trolleys running in two lines of box track round sides of ceiling.

Flooring: Soft, without glare. Linoleum, rugs for photographic purposes.

Accessories: Small dressing room with lavatory and dressing table.

DARK ROOMS

Planning: Accessible from studio and also from outside to avoid necessity of going through studio. Individual dark rooms. Sliding or swinging type doors, tight against light.

Lighting: General illumination with control switch on wall. Safety light on wall fixture just above sink, mounted so as to slide laterally; flexible cord connection with control switches on fixture for different colors as needed.

Heating: 70° recommended, which corresponds to approximate temperature of developing chemicals and baths.

Ventilation: Supply clean fresh air in excess of amount exhausted to keep room under slight pressure, thus keeping out dust from other rooms.

Walls: Waterproof finish for washing.

Flooring: Waterproof and resistant to action of hypo solution. Rubber suggested as best material.

Plumbing: Sinks—lead-lined wood, first choice; cedar wood, second. Acid-proof drains. Mixed hot and cold water, also ice water, in double-jointed universal outlet so as to place stream over sink where desired. Two outlets.

Rittase, Courtesy Haddon Craftsmen

GALLERY FOR PHOTOGRAPHING ILLUSTRATIONS

PHOTO PRINTING ROOMS

Planning: Adjacent to dark rooms, light shield or maze entrance. If arc type printing lamps are used, shield them from print room and vent to carry off carbon dust.

Lighting: General illumination with control switch on wall. Safety lights on wall fixture above sink, stationary mounted; control switch on fixture. Outlets for printing lamps.

Heating, ventilation, walls, flooring, plumbing: Same as for dark rooms.

ART DEPARTMENT

Planning: Photographs and line drawings frequently require retouching before copies can be reproduced. Engraving concerns usually maintain a service offering the preparation of layouts, dummies, designing, photo-retouching, label and box drawing. This art work should be within easy reach of the business office.

Lighting: Art work particularly if in color, requires north light of a constant quality.

Heating, ventilation: For personal comfort.

Soundproofing: Not necessary.

Flooring: Soft, quiet, easy to clean. Linoleum or cork.

PHOTOENGRAVING PROCESSES

GALLERY

Function: Copy from the art room is attached to a frame forming part of the camera stand and photographed on a glass plate treated with a sensitized colloidal film.

Planning: Cameras should be placed with backs to dark rooms for ease in handling plates. Access around all parts of camera but general traffic should not be near cameras. Also important that there should be no motion or vibration of cameras. This is likely to happen if manufacturing (presses in operation) is going on in same building.

Lighting: Soft, diffused. Direct glare from windows is to be avoided, for the camera lens and glass frame will catch reflections. It has been frequently found necessary to paint the window panes opaque; for this reason the gallery might well be windowless. Outlets for portable camera lamps located to permit freedom of movement of equipment; control from operator's dark room. Glare from these lamps to be shielded from rest of room.

Heating: Photographic activity varies with temperature. Fluctuations must be gauged by the machine operators according to their experience. A constant indoor temperature control would eliminate this variable element.

Ventilation: During photographic action, usually from 2 to 3 minutes, strong carbon arc lamps are focussed on the object frame. The carbon arcs give off a white powdery cloud which will settle as a dust unless removed by ventilators.

Air conditioning: Excessive moisture content of the air may cause condensation on the glass plates and screens. Under ordinary conditions this is unlikely.

Walls: Soft color, without glare. Smooth finish to prevent collection of carbon dust and to permit wiping.

Flooring: Easy to stand on for long periods. No trucking or chemical action.

Vibration: Equipment does not produce noise or vibration but should be protected against violent shocks.

DARK ROOMS

Function: Each projection operator has his own dark room where the exposed plate is developed, fixed and intensified.

Planning: Preferably arranged in a row back of cameras. Consider convenience of delivering plates and copy to stripping department.

Lighting: General ceiling illumination, control switch on wall. Safety light, indirect, on wall fixture just above back of sink and mounted to slide laterally so that operator can look through negative with greatest ease. Control switches on fixture for different colors as needed.

Rittase, Courtesy Haddon Craftsmen

FINISHING A HALFTONE NEGATIVE

Heating: Constant at 70°, approximate temperature of chemicals and bath.

Ventilation: Necessary to carry off obnoxious fumes. Direct air supply downward from upper right hand rear corner of room into sink, with exhaust intake just above and back of the sink where odors arise from plates in sink.

Air conditioning: Air should be filtered and free from dust since particles will spoil the plates. Humidity changes affect strength of solutions and acids.

Walls: Waterproof finish for washing.

Flooring: Waterproof finish to resist acid and hypo action. Rubber recommended.

Plumbing: Acid-proof drains. Water mixed hot and cold in double-jointed outlet about 5′ above floor. Ice water connection preferred if summer temperature of cold water is above 65°. Sinks to resist hypo solutions—glass, lead and rubber not affected; lead-lined cedar best, with alberene stone and asphalted cedar as alternates.

STRIPPING AND PRINTING

Function: The finished negative is next manipulated to print on metal. It is coated with rubber solution and collodion, cut to size and soaked in acetic acid to be loosened from the glass plate. After being stripped, it is turned over and grouped with other negatives on a larger plate glass, ready for the printing frame. Zinc is used for line work, copper for halftones. Both metals are coated with sensitizers. Light action from powerful carbon arc lamps makes the sensitized surface insoluble in water; portions protected by negative will dissolve.

Planning: Locate for easy flow of work between dark rooms and etching rooms.

Lighting: General illumination. Local light under stripping frame or bench. Printing lamps, portable carbon arcs. Daylight desirable over stripping sink and bench. Printing in semi-dark area, away from direct sunlight.

Ventilation: Necessary to carry off film coating fumes at stripping sink and carbon dust from arc lamps.

Air conditioning: Filtered air, free from dust. Humidity must not become excessive: otherwise the negatives absorb moisture from the air and become soggy which necessitates their being rebaked in the oven.

Flooring: Easy to stand on and to clean.

Plumbing: Acid-proof drains. Equipment requirements similar to those for dark rooms.

ETCHING

Function: Zinc plates are rolled with etching ink, developed in water, dusted with powder which is heated to melt, making the inked image impervious to acid action but leaving desired surfaces exposed.

Etching is carried on in successive "bitings" until the necessary depth is reached. A resinous powder called "dragon's blood" is dusted over the line plate, brushed in and melted by heat to prevent undercutting or lateral etching.

Copper etching is usually separated from the zinc etching since a different acid, iron perchloride, is used. Progress of the first bite is shown in relief by powdered calc. Tones to be held are painted over with an acid resistant, the plate is heated and cooled, and etching continued by stages. Requirements are much the same as those for zinc etching.

Planning: Locate near printing and also finishing and Benday screen rooms.

Lighting: General illumination. Strong daylight desirable for observing face of zinc plate while etching.

Heating: Temperature changes affect the printing and etching activity. In summer, the room temperature frequently becomes excessively high because of the heat that is produced from the stoves. Constant temperature and air changes at all times are requisite for both the chemical processes and personal comfort.

Ventilation: Exhaust only to remove odors and acid fumes. Baths are guarded by covers and fans discharge fumes through acid-proof ducts direct to outside of building or into exhaust system if properly diluted. Dust particles of dragon's blood will also be absorbed in breathing unless controlled by exhaust ventilation. No fresh air supply—allow air to enter from other rooms to prevent fumes entering other departments.

Air conditioning: Not necessary for process.

Walls: Smooth finish to avoid collection of dust.

Floors: Acid-proof, pitch to drains. Quarry tile recommended.

Plumbing: Acid-proof drains from sink and floor drains under etching machine outlets. Water mixed hot and cold in double-jointed outlet 5′ above floor. Sink of alberene stone or asphalted cedar to resist nitric acid action.

BENDAY SCREENS

Function: For tint-laying additional plates must be made, one for each color.

Planning: Near printing and etching room.

Lighting: Uniformly controlled north light so that color can be properly matched. "Daylight" electric lamps for night work.

ROUTING AND BLOCKING

Function: Routing is the mechanical operation of cutting away the surplus metal of the printing plate. Unless for newspaper reproduction, the plates are nailed to wood blocks or, in special cases, sweated to a solid metal type-high base. The mounted plates are sawed to size, trimmed for exact square and planed to exact type height.

Planning: Near finishing room.

Lighting: The work calls for the greatest precision. Ordinary daylight illumination is insufficient; concentrated artificial lighting is provided on each machine, so it is not necessary to place the machines near windows.

Air conditioning: Since wood will swell with moisture changes and exact dimensions are required, humidity control is advisable.

Soundproofing: Isolation desirable since cutting tools and saws produce noise.

Flooring: Easy to stand on and able to withstand abrasive action of metal chips. No trucking.

FINISHING AND PROOFING

Function and planning: All halftone etchings require work by the finishing department before reaching the routing stage. But all zinc and copper engravings are tooled for small irregularities by the finisher after being mounted. These operations consequently should be near together, though it is desirable to isolate the noise of routing and blocking.

Lighting: General illumination for finishing which requires good reflection from face of zinc plates. Uniform north light for proofing presses if matching colors.

Heating, ventilation: For personal comfort.

Air conditioning: Not required, except possibly for close register on color proofing presses.

Flooring: Easy to stand on. No trucking.

COMPOSING DEPARTMENT

Function: In a newspaper composing room operations move speedily. Copy is taken from the pneumatic tubes and distributed to the linotype operators. At deadline time, when the paper must go to press, each operator sets not more than 3½ inches of type on a story. When his take is finished he puts the slugs on a dump where an assembler pieces together the complete article and turns the galley over to a proofer. Proofs are read and corrections, if needed, are made. The make-up man makes up the complete page from the corrected galleys. Lockup for late copy can be finished within ten minutes after the copy is received by the compositors.

For other kinds of printing plants the routine is much the same. Type is usually set up by hand, or by hand-operated machines—linotype or intertype, which cast slugs (solid lines of type) or monotype, which sets justified lines of single type. Ludlow is used mostly for display lines; type is cast from matrices which are composed by hand and distributed after casting. The linotype machines have lead pots for casting the slugs; ventilation consequently is necessary to remove the fumes and individual ducts sometimes are used above machines. The monotype machines are in two parts—keyboards and casters.

The larger display sizes of type are still set up by hand and the assembling and make-up work is largely by hand.

Planning: Communication with engraving and editorial departments, also pressroom, especially in book and job plants. Casting machines, which give off fumes and noise, should be placed in a separate room controlled for both ventilation and sound insulation. Monotype casters practically have to be isolated; they are very noisy. The keyboard operators should be so arranged that attention will not be diverted from copy. Room should be higher than ordinary office floors, usually about 13′ floor to ceiling. Calculate floor load of 200 lbs. per sq. ft. for rigidity against vibration and heavy concentrated loads, present or future.

Lighting: Frequently the typesetting machines are so placed that the operators face strong light coming in through the windows or else their own shadows fall across the keyboards. These conditions are to be avoided. Local lights used on typesetting machines and makeup banks; outlets should be in the floor. For imposition illumination should be of high intensity, without glare, so that reflection from type face is definite but not objectionable; mercury vapor lamps are recommended to reduce eye strain. The entire ad alley and make-up area should have a blanket of uniform candle power at the working plane so that hand composition or reading of type can be done at any point.

Heating: Constant temperature, moderate for comfort. Machines create considerable heat.

Ventilation: For personal comfort. Not necessary for mechanical operation except for smelting pots on monotype casters which can be isolated or on linotypes which can be separately ventilated. Individual ducts often used on monotype casters.

COMPOSING ROOM, McCALL PLANT
LOCKWOOD GREENE ENGINEERS, INC.

Air conditioning: Not necessary for mechanical operation.

Soundproofing: Desirable to deaden or isolate sounds of noisy typesetting equipment.

Flooring: Easy to stand on and able to withstand light trucking. Provide for outlets.

Services: Conduits for power, gas, water, drain and air to various machines should be laid above structural floor slab but below finished floor for present or future access or extension.

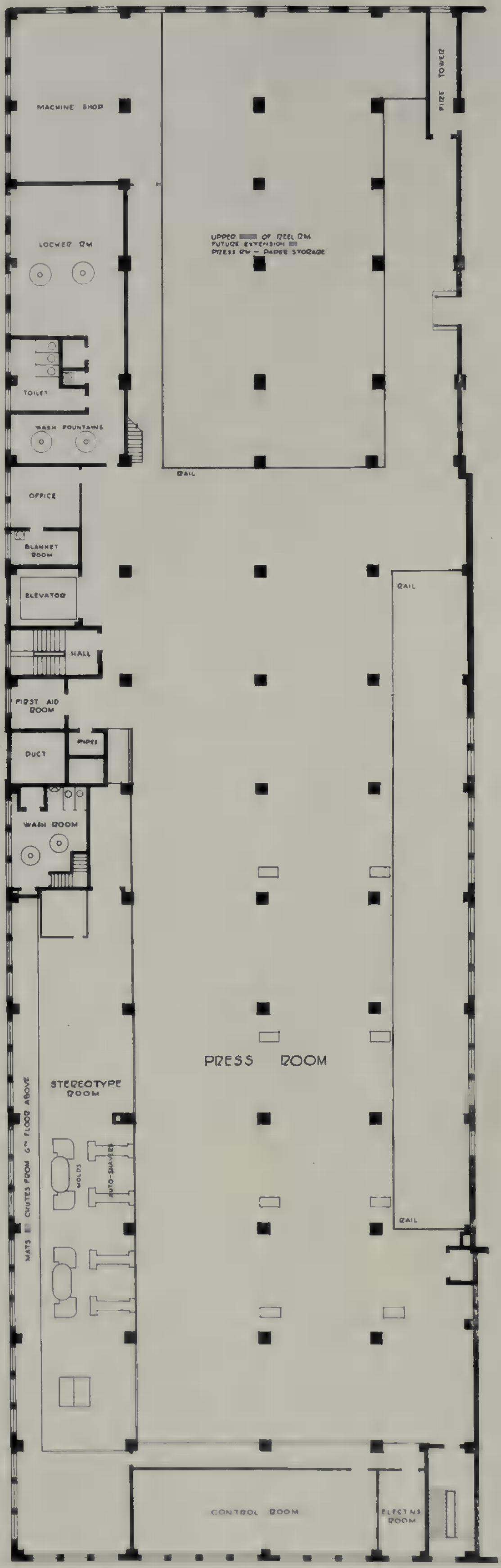
PROOFREADING

Function: Proofreading is usually performed by pairs—one reads from the original copy, the other checks the proof.

Planning: Usually in or near the composing room. It should be isolated from the sounds and activity of the composing room. Mark-offs from galley proofs should be placed on a hook in the center of the room so that readers will not be required to wander about from desk to desk in search of some particular copy, thus diverting attention. Other employees should be forbidden entrance.

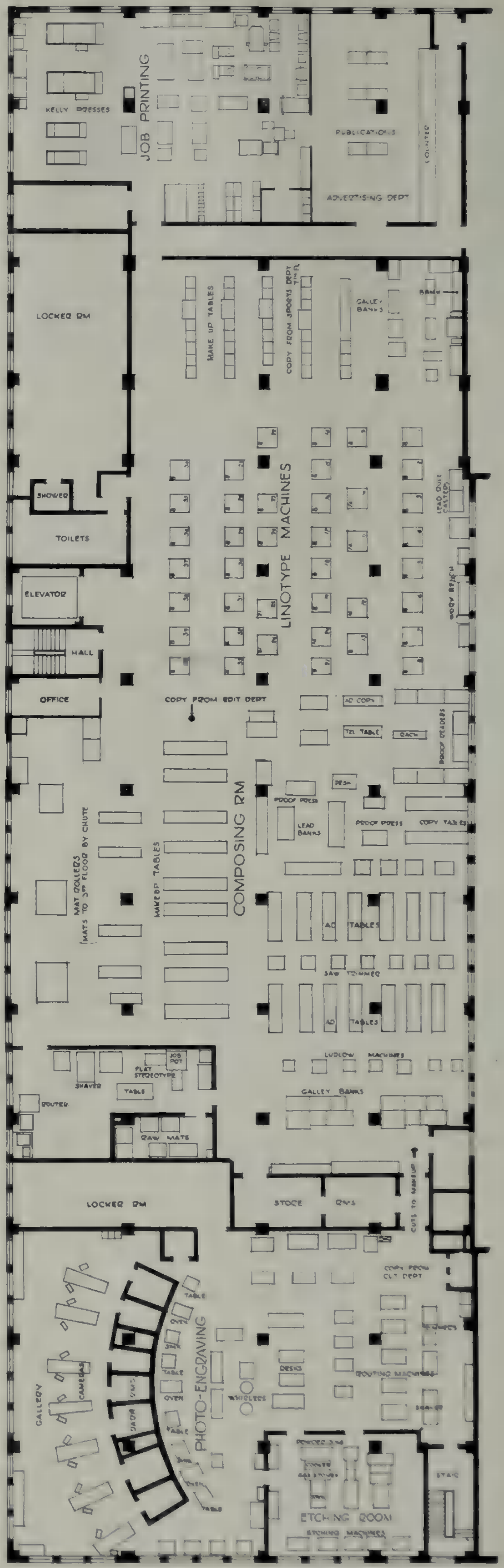
Lighting: General illumination, local desk lights, for reading and checking.

Soundproofing: Very necessary to deaden and isolate all noises. All readers' desks should be enclosed in front and on the sides so that a reader with a harsh or squeaky voice will not be a source of annoyance to other readers.



Press and stereotype rooms, third floor

NEW YORK DAILY NEWS
LOCKWOOD GREENE ENGINEERS, INC.
HOOD AND HOWELLS, ARCHITECTS



Composing and photoengraving rooms, sixth floor.

FOUNDRY OPERATIONS

Function: For small editions the original plates and type are used in the printing process. But where the editions are large or speed in production is required it becomes necessary to duplicate the forms many times. This duplication is performed usually either by stereotyping (confined to newspapers) or by electrotyping the plates and type.

Stereotyping: When the newspaper forms are completed and locked up, they are conveyed by transfer trucks to molding machines where matrices or "mats" are made. Steam-heated presses record the impressions of the type matter on the matrix, a fabric of special composition. These mats are curved, backed where necessary with reinforcing pads, and placed in the autoplate casters, which are flooded with molten metal from a large metal pot. The casters can turn out four semi-cylindrical plates a minute, cast, shaved, water-cooled, brushed, and en route to the printing presses by conveyors.

Electrotyping: This process is used for large magazine or book editions and also better grade commercial printing. It consists in making a mold in wax or prepared lead on which a coating of copper is electrolytically deposited. The copper film is then backed with molten metal alloy.

Planning: Since *plates* are supplied to the presses, the stereotyping department must of necessity be as near (either horizontally or vertically) the pressroom as possible. Since the plates are made from *forms* fabricated in the composing room, the stereotyping room should also be adjacent to the composing room. Since it is easier to convey the mats than the heavy plates, the stereotype foundry can be located to better advantage on the same floor with the presses than on the composing room floor, if it is found necessary to separate the operations.

The stereotyping department handles plate or job casts as well as curved plate work. In the largest plants the work is separated and handled by independent crews. In smaller plants the division is dependent on cost and labor conditions. A saving in labor is often possible with a combined department wherein the men work on either job or plate work as needed.

When a metropolitan paper maintains a branch plant in another part of the city, mats are made in the central plant, chuted to the street and rushed crosstown to the branch foundry. This procedure is usually followed by New York papers printing a Brooklyn edition.

In newspaper plants conveyors carry the plates from the stereotype room to the pressroom and back again after being used to be resmelted.

Calculate floor loads of 500 lbs. per sq. ft. for space around large metal pots, 200 lbs. per sq. ft. for general department, to assure rigidity against mechanical vibrations and concentrated loads, present or future.

STEREOTYPE ROOM, N. Y. DAILY NEWS
LOCKWOOD GREENE ENGINEERS, INC.
HOOD AND HOWELLS, ARCHITECTS

Lighting: Fairly high intensity, without glare. Mercury vapor suggested to relieve eyestrain.

Heating: Moderate for personal comfort. Control heat given off by pots and dryers.

Ventilation: For comfort. Hoods over metal pots to prevent fumes from penetrating the room.

When the composing and stereotyping rooms are on the same floor, it is often good engineering to supply all the air to the composing room and exhaust it from a point over the metal pot. This method eliminates heat and odors from the composing room.

Because the various plant departments operate at different hours, the ventilation system should be so designed that in order to obtain ventilation in one department it will not be necessary to operate the equipment for the entire building.

Air conditioning: Not necessary. Mats are conditioned in special apparatus to the desired moisture content and are handled so rapidly that humidity variations have a negligible effect.

Soundproofing: Not required.

Flooring: To withstand heavy trucking and battering from dropping of plates. Standard wood block over soft but rigid fill in which conduits and pipes are placed.

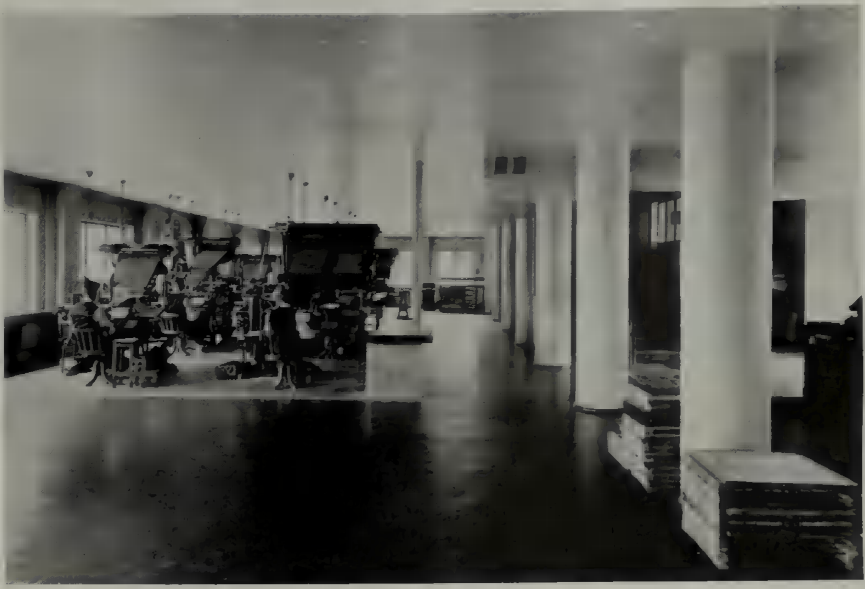
Services: Power, gas, water, drain and air to various machines to be laid in fill between structural floor slab and finished flooring for ready access. Monorails over heavy equipment. Water supply may be recirculated from large tank.

Drainage: From cooling system of casting and finishing machines; open discharge into large pipe, with common trap to intercept metal chips and oil.

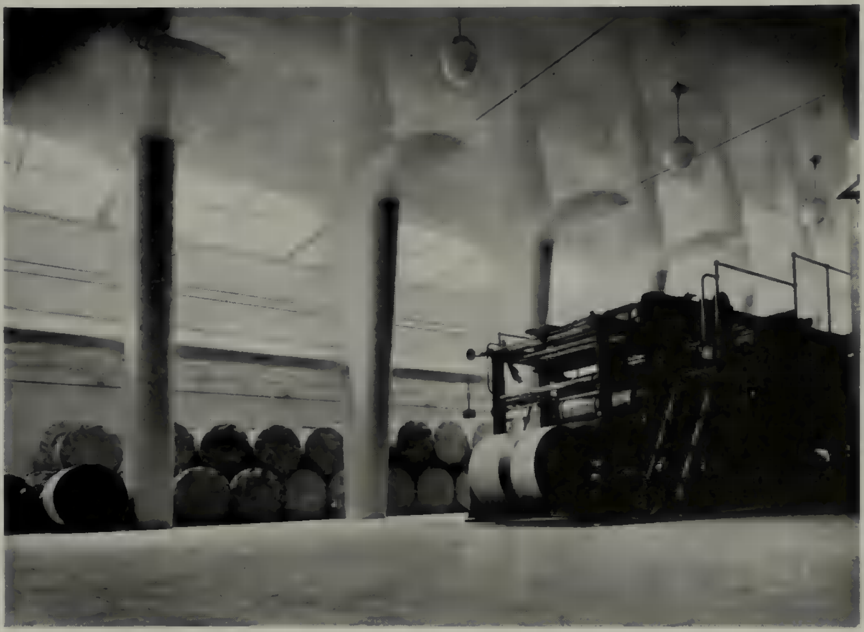
TURUN SANOMAT NEWSPAPER PLANT

HELSINGFORS, FINLAND

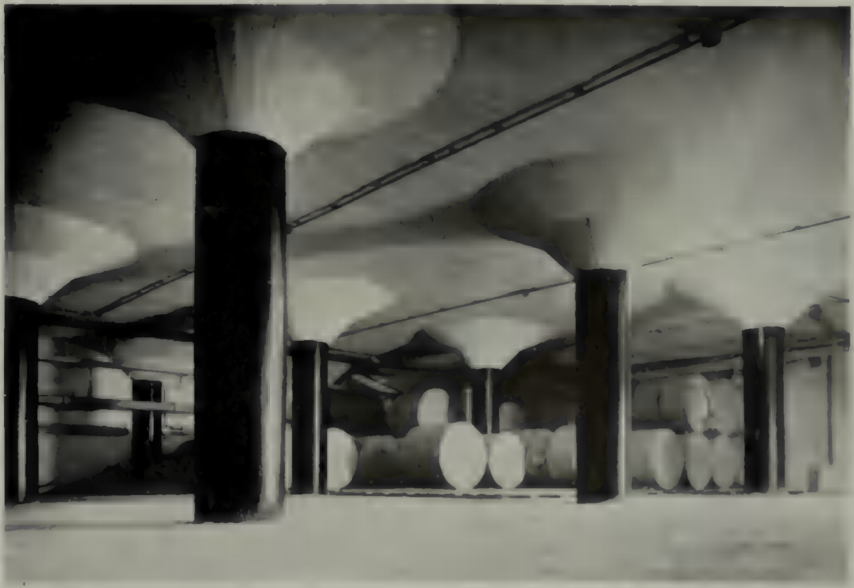
ALVAR AALTO, ARCHITECT



Composing room



Press room



Gustaf Velin

Paper storage

PRESSES

Function: When the locked-up forms, stereotype cylinder plates or electrotypes come to the pressroom, they are placed in the presses. This process varies greatly from a few minutes for the newspaper rotaries to many hours for flat-bed presses when "makeready" (building up impressions with underlays or overlays and "spotting") for exact register and inking surface is demanded.

Varieties of printing machines are too numerous to detail. Whatever the type of press in use, the general requirements are much the same.

Planning: A high spacious room aids to maintain uniform operating conditions and is necessary to accommodate large presses. Ready access between press floor and paper service floor. If pressroom is not to be seen from the street level—sometimes desirable for advertising purposes—it is advisable then to have a visitors' gallery on a mezzanine floor from which they can watch the presses whirring out the editions. Such an arrangement prevents the occurrence of accidents.

The newspaper press is a long, narrow, highly efficient and speedy combination of separate printing units. The unusual length of the press necessitates a long, narrow pressroom, an unwieldy element in the plant. It is important that the mailing room be directly adjacent and parallel, if possible, to the pressroom and that the trucking space connect directly with the mailing room.

Lighting: General illumination. Local lights for press operation. Lights on cords for use on bed of press, etc. Controlled north light for color presses.

Heating: Uniform at 80° for best ink action.

Ventilation: Desirable to carry off ink and paper dust, and heat of press motors. Temperature and humidity to be controlled.

Air conditioning: Difficulties occur when the relative humidity is too low, too high, or variable.

Absolute control of register, particularly in color work, is essential. The process plates—yellow, red, blue and black—require special impressions and are usually run a day apart for drying. If there is no humidity control, the paper will very likely show a stretch or contraction between runs.

Press rollers, mostly glue and glycerine, take on and throw off moisture in response to changes in relative humidity. These changes affect the life of the rollers as well as their operation. Water-logged rollers separate the ink ingredients. Dried rollers become hard and crack. Curtis plant's biggest saving with humidification is on rollers.

Soundproofing: Ceilings and walls treated to reduce press noises.

Isolation: Presses should be isolated from building structure by permanent, highly resilient material below substructure of press. This prevents press noises telegraphing through building and also improves press operation.

PRESS ROOM, N. Y. DAILY NEWS
LOCKWOOD GREENE ENGINEERS, INC.
HOOD AND HOWELLS, ARCHITECTS

Monorails: 2-ton capacity, over presses for erection and repair service.

Walls: Smooth, waterproof finish for ease in cleaning off ink and paper dust.

Floors: To withstand heavy trucking and abuse from metal plates; easy to repair. Access space to press drive shafts. Floor becomes oily and slippery from ink, oil, type metal. Wood blocks are less slippery and less damaging to edges of new press plates if dropped. In some of the latest plants the floor separating the reel room from the pressroom is checkered steel plate or metal grids, isolated from the presses so that no vibration is transmitted and with removable sections providing access to motors and press drives.

Services: Washing facilities should be conveniently accessible, since printers must frequently wash their hands of ink stains and they should not have far to go to reach soap and water.

REEL ROOM

Function: In the printing of newspapers, the paper rolls are fed into the presses from the floor below, called the reel room. A system of tracks, switches and turntables allows the rolls to be moved from storage space and installed on the presses without any cessation of the printing operation.

Planning: Pressmen use stairs coming up from the reel room but prefer to go down by gravity on "firemen's poles." Automatic lifts deliver the paper rolls from storage floors to the reel room floor, which should be partly raised to facilitate placing the rolls on the small trucks which convey them on tracks to the presses.

Air conditioning: It is desirable to have sufficient paper storage space in the reel room in order to allow for the absorption of some moisture from the conditioned air in the reel room.

Flooring: Concrete with track system for handling paper; otherwise no heavy trucking.

BINDERY

Function: Newspapers are automatically folded and go directly to the mailing room for delivery. Magazines and books, however, are printed in signatures of 16, 32 or 64 pages. These signatures are collated, stitched or stapled together by machinery. Covers are glued on and pages trimmed to size.
Planning: Accessible to shipping rooms.
Lighting: Uniform illumination.
Heating: Controlled, uniform.
Ventilation: To remove disagreeable odor of glue.
Air conditioning: Slight changes in moisture content are less serious in the bindery than in the pressroom but a low or unduly high humidity is the cause of much spoiled work. Static electricity, curling and bulging of sheets, shrinkage or stretching of paper cause trouble but the most serious difficulty is the cracking or breaking of sheets when folded. This is often due to use of heaters (for ink setting) on press. Thin papers fold better than thick, uncoated papers better than coated. Since a dry atmosphere makes the paper weaker and more brittle, a high relative humidity is recommended.

The consistency and drying properties of glues and pastes are also affected.
Flooring: Easy to stand on.

BINDERY, McCALL PLANT
LOCKWOOD GREENE ENGINEERS, INC.

MAILING ROOMS

Function: The folded newspapers, as they come out of the pressroom on belt conveyors, are stacked, stuffed, bundled and rushed to waiting trucks or trains for distribution. With magazines, books and other printed matter speed is not so essential, but the process should be expedited as much as possible.

Planning: Ample working and trucking space is desirable; likewise, easy access to the loading platforms. Furthermore there should be no conflict between incoming supplies and outgoing products.

Loading platforms should be outside or below the delivery rooms and so arranged that men loading the trucks will be sheltered from rain or snow. Ample trucking space is desirable to take care of future expansion and unusual peak-load rushes. This trucking space should in nowise interfere with street traffic.
Lighting: Uniform illumination.
Heating: Moderate, constant temperature.
Ventilation: For personal comfort.
Air conditioning: Not required.
Soundproofing: Not required.
Flooring: To withstand moderate trucking.

MAILING ROOM, DETROIT NEWS
ALBERT KAHN, ARCHITECT

ANCILLARY DEPARTMENTS

Welfare of employees

A hospital room, with separate toilet facilities, is desirable for emergency cases.

The New York *Daily News*, for instance, has a small clinic with a nurse in charge at all times. Regular prophylactic dental service is given free. A dentist examines teeth twice yearly and gives advice on oral hygiene. The newest equipment is furnished for medical treatment. Sinks are knee-operated to keep hands sterile.

Recreation, reading and rest rooms for employees, as well as luncheon or cafeteria facilities, have a decided influence in maintaining a good morale.

Washroom facilities

Not only should sinks be provided in the pressroom for frequent washing up but the facilities in the locker rooms should be such that many men can be accommodated without overcrowding. The wash fountain type has been found very satisfactory. Sinks used for acids should be used under no conditions for personal washing. Showers are desirable.

Plumbing equipment should be fool proof. Ordinary house fixtures are unsuited. Special plumbing is necessary for acid wastes. Closet bowls should be of heavy porcelain, easy to clean and equipped with extra large waste openings to remove pocket rules, cigarette boxes and the like which may be dropped in by accident. Printers are congenitally careless in this respect.

Incoming supplies

Incoming newspaper rolls are rolled, trucked or conveyed by gravity rollers from sheltered loading platforms to huge hoists and thence to storage floors. Special apparatus lifts the heavy rolls into tiers three high where they are stored until needed.

Ink is stored in huge tanks, filled from tank trucks on the outside street level or from railroad tank cars. It should be continuously circulated or agitated to prevent settlement and separation; 80° is the best operating temperature.

Stockroom

This should be near the purchasing department and accessible to the freight elevator or to those departments in frequent need of such supplies.

Paper storage

Function: Large supplies of paper must be kept on hand in any plant, particularly newspapers, to prevent any tie-up of material from mill fires, transportation delays, strikes, or other unforeseen events.
Planning: Accessible to presses.
Lighting: Fair intensity, controlled for various storage sections.
Heating: Uniformly moderate, same as pressroom temperature.
Ventilation: Not necessary.
Flooring: Concrete finish suitable for moderate trucking, slightly pitched to facilitate drainage of water in case of pipe leakage or other accidental flooding. Floors to withstand shock of rolls sliding down from upper tiers. Loading calculations depend on height of storage.

Water storage

In large newspaper plants so much water is used in cooling hot metal that for economy of consumption the water, after it has passed through the various pieces of apparatus, is pumped to a storage tank. The water from this tank is then used in the plumbing fixtures.

Electrical control room

The press drive and the stereotyping metal pots require heavy wire and conduits. For economy it is advisable to locate the control room so that a minimum of copper is required.

Job press

Many newspapers have job press departments to print internal office forms, circulation and advertising promotion, and sometimes outside jobs. The requirements are like those already noted.

Machine shop

For quick repairs of equipment a machine shop, completely equipped with lathes, hack saws, drill press and other machinery, is desirable. It should be centrally located so that carpenters and machinists can be easily reached. An overhead track system is excellent for carrying heavy cylinders and press parts to this shop. The shop should be accessible to incoming supplies and insulated for noise.

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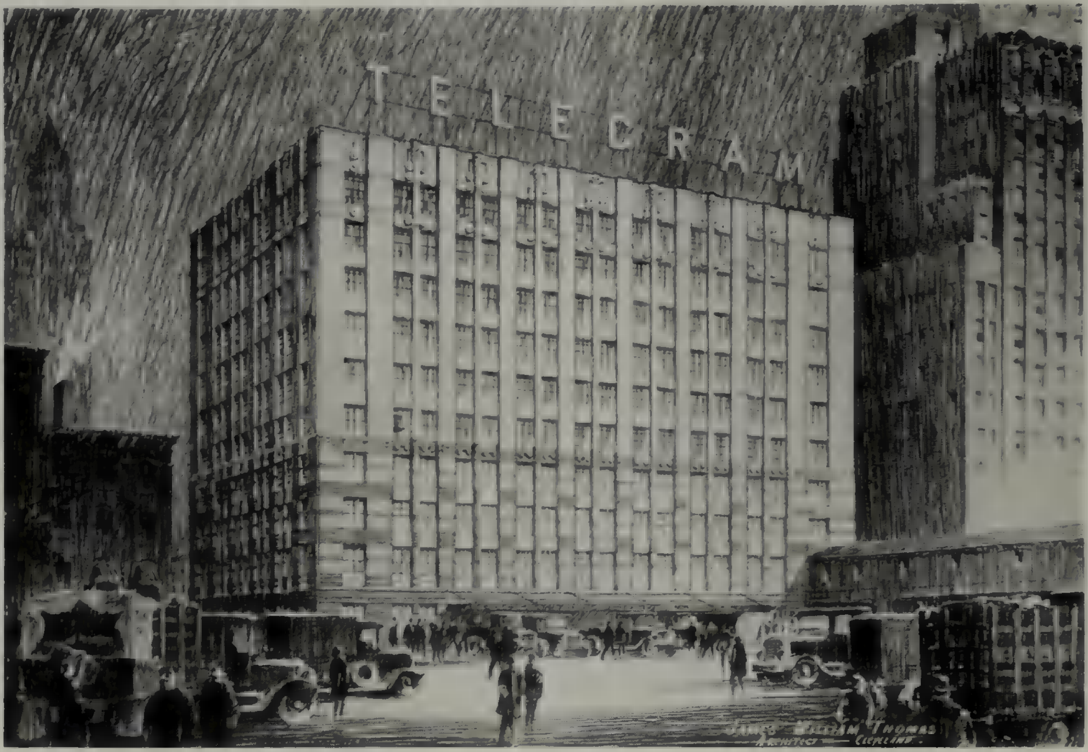
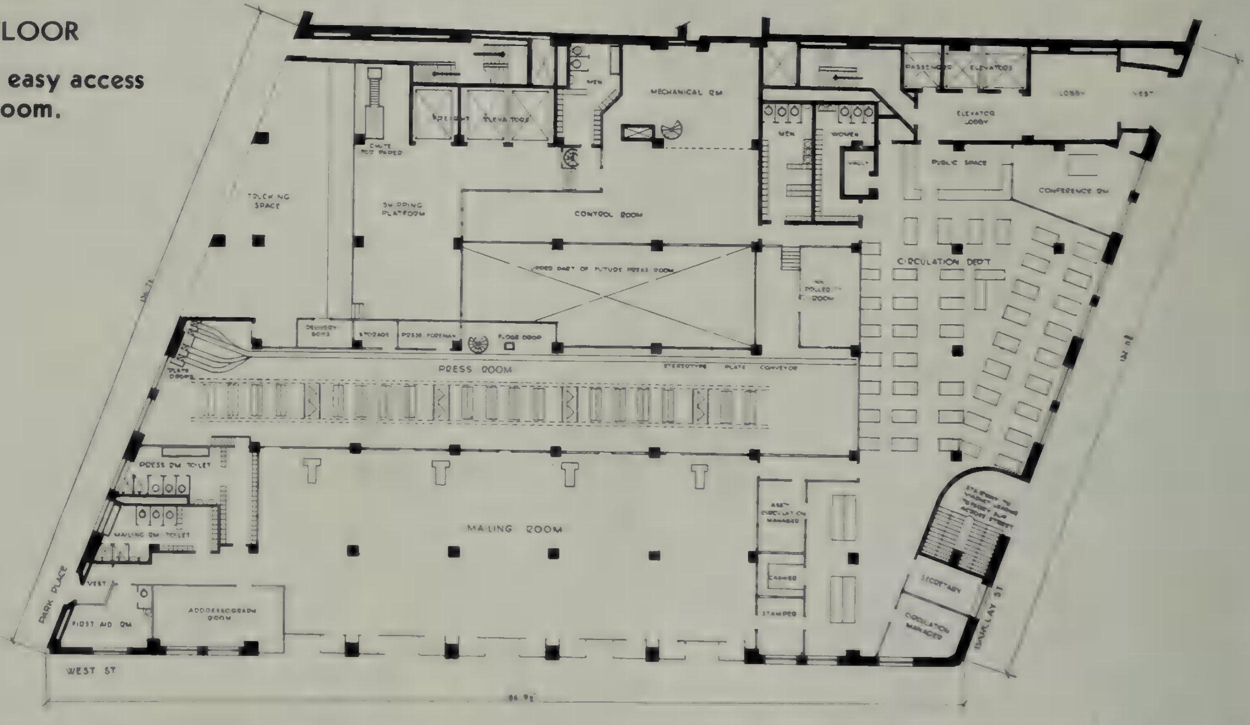


NEW BUILDING FOR NEW YORK TELEGRAM

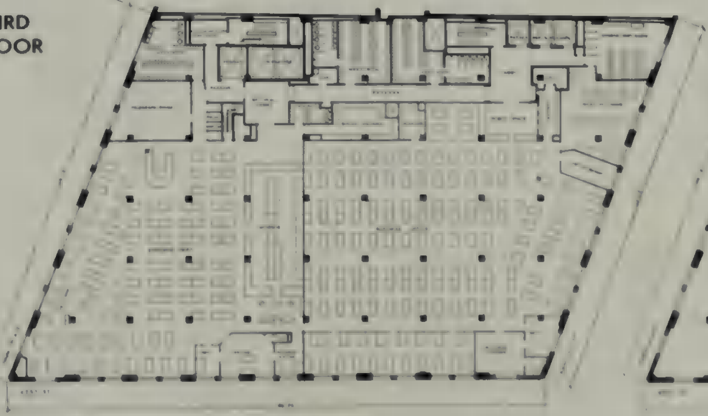
J. W. THOMAS, ARCHITECT

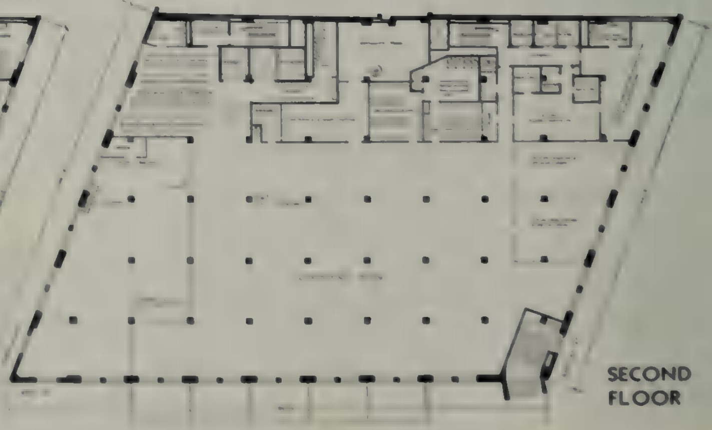
GROUND FLOOR

Trucks have easy access to mailing room.



THIRD FLOOR





SECOND FLOOR

AIR CONDITIONING OF PRINTING PLANTS

In the processing of any hygroscopic material, control of the relative humidity is an important factor. Paper is sensitive to moisture. The printing and lithographic trades especially require a definite and unvaried humidity so that frequently, even hourly, the normal quantity of moisture in the air must be increased, other times decreased. Exact humidity control is necessary for proper register of successive printings of different colors on a sheet of paper.

WEATHER CONDITIONS

During the winter conditions in the pressrooms and printshops are particularly bad. Although the outside humidity may be fairly high, the air temperature is low and when this air is heated to building temperatures, the relative humidity suffers a serious reduction. As an example, air at 40° F. and 50 per cent relative humidity, which are normal weather conditions, when heated to 75° shows a reduction in the relative humidity to 15 per cent. This is unsatisfactory for both the workmen and the mechanical operations.

In summer conditions are frequently just the converse. Summer air contains a considerable quantity of moisture. If the temperature is rapidly reduced, then the quantity of moisture remaining constant, the relative humidity must increase, and if the air contains more water than it can hold at that temperature, there will be condensation, especially near walls or any cold object. A normal, comfortably hot day in the summer might have a temperature of 90° F. and a humidity of 60 per cent. It is only necessary to drop the temperature to 74° to cause over 100 per cent humidity as a consequent condensation of water vapor.

RELATIVE HUMIDITY AND PAPER

Paper absorbs or gives up moisture until it comes to equilibrium with the existing temperature of the room. In fact, ordinary paper is never absolutely dry, as shown by the following table:

% Relative Humidity..	100	90	80	70	60	50	40	30	20
% Moisture in Paper ...	21.5	13.5	8.9	8.4	6.5	5.6	3.4	2.3	1.8

Temperature..70° F.

When paper is exposed freely to the air, changes in moisture content take place rapidly. If covered by other sheets the change may be very slow and unequal.

Humidity affects paper in nearly all its valuable characteristics:

1. *Dimensions.* Changes in moisture content cause the cellulose fibres of paper to swell or shrink, resulting in corresponding changes in length, width and thickness of each sheet. This property of paper is familiar to architects who have had experience in making stretches of Whatman paper. A 74″ sheet may vary as much as ½″ from one day to the next. Sudden changes in relative humidity will make paper curl, or if piled, wave or buckle at the edges.
2. *Electrical conductivity.* Static electricity in paper gives much trouble in unhumidified print shops. When paper is dry it becomes readily charged with electricity and clings to everything it touches. In a moist atmosphere static charges are less easily generated and more quickly neutralized or grounded.
3. *Strength* of paper also depends on moisture content.
4. *Folding endurance.* A report of the Bureau of Standards states that the folding endurance of paper increases regularly, as the relative humidity lies between 15 and 83 per cent.
5. *Inking properties* are better under humidity control.

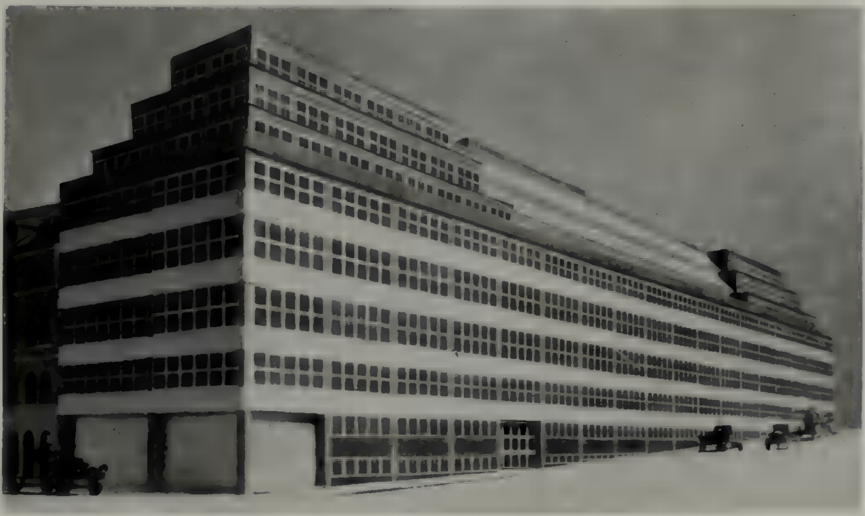
EFFECT OF ATMOSPHERIC CONDITIONS ON HEALTH AND COMFORT

Studies on effective temperature, undertaken by the A. S. H. V. E., in cooperation with the United States Public Health Service and the United States Bureau of Mines, indicate the importance of relative humidity to health. The subject is comparatively new and many tests have yet to be made to determine accurately the comfort zones which are most beneficial to health.

Too much moisture in the air, coupled with high temperature, is obviously uncomfortable. Too low a relative humidity is physiologically harmful. According to Dr. W. W. Wilson of the United States Weather Bureau, the evaporative power of the air at a relative humidity of as low as 30 per cent is very great and when the mucous membranes and tissues of the respiratory tract are subjected to this trying process, the glands must increase their functional activity in order to keep the membranes in proper physiological condition. This increase of activity tends to make the glands become enlarged and the membranes to become thickened and harsh, causing the surface to be receptive to disease germs. Cases have been observed where catarrhal troubles have been relieved by simply introducing sufficient moisture into the air to bring conditions to something nearly normal. In plants where humidification has been adopted, fewer colds and sore throats occur.

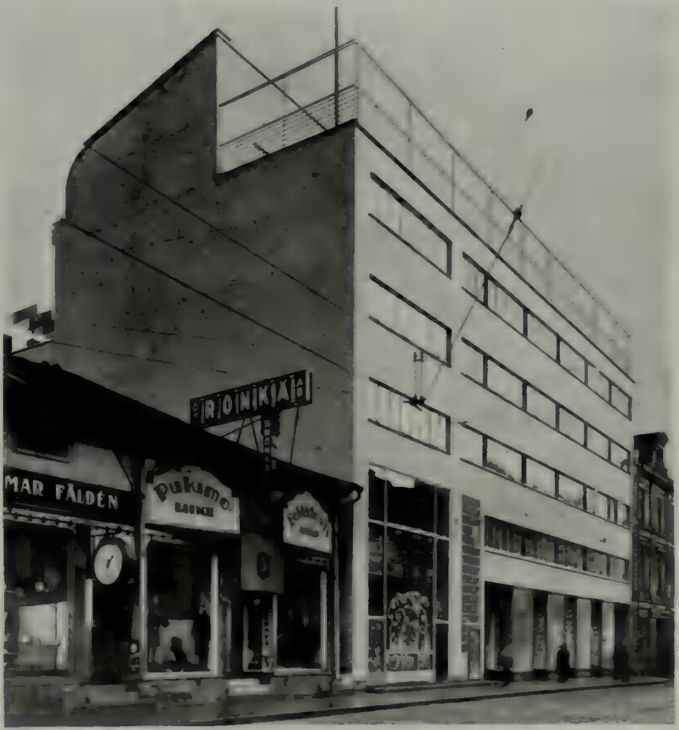
According to medical opinion and effective temperature between 65° and 70° is considered good. This may be increased to 80° or even 82° occasionally during summer weather without excessive discomfort or injury to health.

EUROPEAN PLANTS

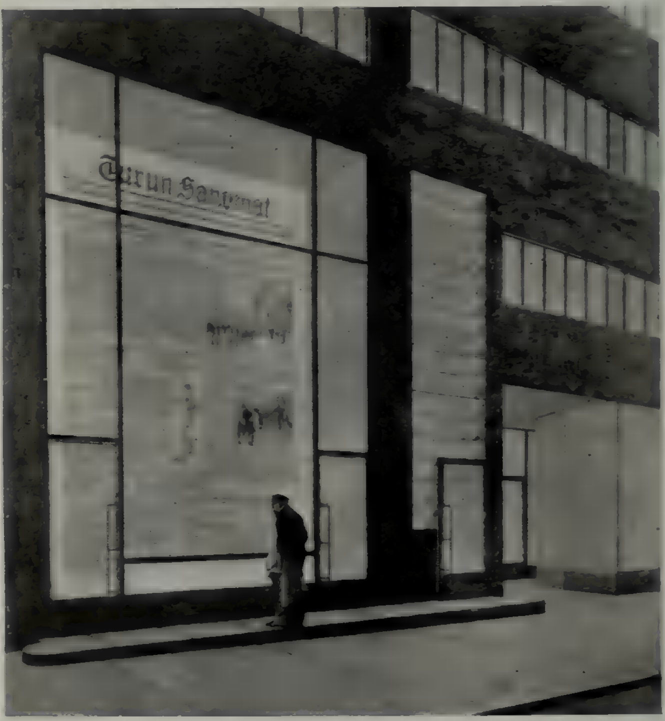


Byggmästaren

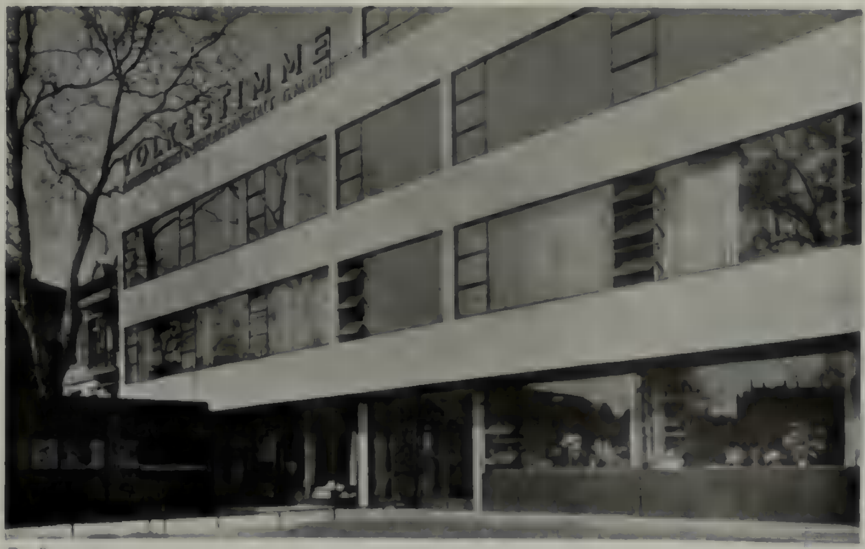
MODEL, LITHOGRAPHIC PLANT
STOCKHOLM
IVAR TENBGOM, ARCHITECT



Arkitekten



TURUN SANOMAT, NEWSPAPER
HELSINGFORS, FINLAND
ALVAR AALTO ARCHITECT



Der Baumeister

VOLKSTIMME,
NEWSPAPER OFFICES
FRANKFURT, GERMANY
ARMIN LEHR ARCHITECT

RECOMMENDED TEMPERATURE FOR RELATIVE HUMIDITY

Any fixed condition must be a compromise between the several desired conditions. What is best for paper, for instance, may be too high for comfort. When everything is taken into consideration—health paper, ink, roll and weather—a relative humidity of 55 per cent is recommended by one manufacturer of humidification equipment as the best all-year condition for pressrooms. Another manufacturer suggests a relative humidity of from 40 to 50 per cent in the winter and from 55 to 65 per cent in the summer, with a temperature of from 75° to 85° as optimum. Another recommendation states as a desirable relative humidity 50 per cent from October to April inclusive and 60 per cent from the first of May until the last of September.

In the Chicago *Evening Post*, a constant all-year pressroom temperature of 80° and a relative humidity of 77 per cent give satisfactory results. The air is free from dust, and less paper and ink are used. The health of pressmen is very good.

Except for a few days in the summer the natural indoor humidity in most localities is lower than 55 per cent. This moisture deficit demands humidification for best working conditions. In localities where hot weather is constant, dehumidification equipment is advisable. Very few printing plants now have this.

SYSTEMS OF HUMIDIFICATION

Humidifiers may be divided into three general types according to method of operation:

(1) direct—spraying water into the air where it is rapidly evaporated.

(2) indirect—introduction of moistened air into the room.

(3) combined—direct and indirect.

Evaporation systems

A wet towel on the radiator is a primitive form of air conditioning. Likewise any device depending upon exposure of surface of heated water to air in natural, conductive or forced circulation. Before controllable humidification apparatus was developed one could frequently see water standing in printshops in open pans or open mesh cloth exposed to the circulating air. This system is so low in evaporative capacity that its application is generally unsatisfactory. The surface of water in contact with the air when the water stands in a pan, even as large as 3 feet square, is obviously very much less than when the water is broken up into small particles and each particle is completely surrounded by air.

Atomizers

For the average printing plant the simplest, cheapest wet system is the atomizer type. Water is drawn into the nozzle of atomizer heads and atomized by a small jet of air under high pressure so that the water is broken up into fine particles. The finer the particles of water, the greater the evaporative capacity and the less the precipitation of moisture on machinery and material beneath the atomizers.

In another type, water is sprayed at high pressure to an atomized nozzle located in a sheet metal enclosure suspended from ceiling and through which a current of air passes. A method of baffling separates the heavier particles of water and only the finest particles pass into the room with the current of air.

This system consists of a compressor, receiving tank, after-cooler (sometimes omitted), atomizers or heads, pipe lines for conveying air and water to the heads, either a float tank or pump, depending on whether or not the system uses water under pressure.

An efficient type of humidification for press and reel rooms has been developed by the Chicago *Evening Post*. Atomizing heads operating with steam, or water and air, are located under paper web of presses and in aisles between presses. The system is under control resulting in a constant humidity throughout 24 hours a day. Graphic records are kept of the temperature and humidity, which average 80° and 77 per cent.

Ease of cleaning, permanency, accuracy of construction, suitable material for heat, quality of workmanship in installation, possibility of inspection and repair service are factors to be considered in selecting an atomizer system. The action should be satisfactory and positive to prevent wetting-down. If the air is shut off at a distant point from the heads and no provision made to relieve pressure in the lines rapidly, precipitation will occur.

Centrifugal humidifiers

This system breaks up the water into fine spray by mechanical centrifugal force. A small jet of water is thrown on a disk rotating at high velocity within a saturated circular cone consisting of fine metal strips or teeth, against which the water thrown from the disk impinges. A fan forces air through the finely atomized particles of water.

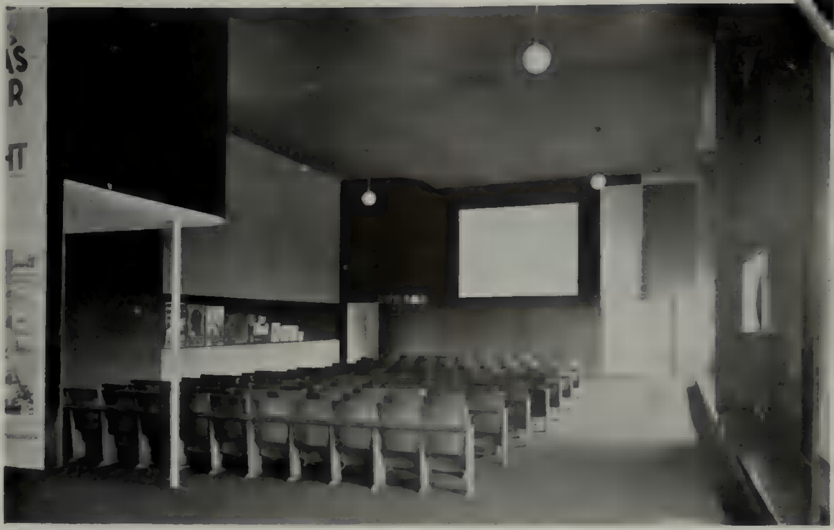
Centrifugal humidifiers are good for small installations. They are self-contained and require only connection to the lighting circuit, water spray and the drain. Good distribution of moisture is maintained. Capacity, however, is lower than in other types of humidifiers and power consumption is high. An excess of water is thrown off from the disk and runs to waste unless it is returned to a tank to be filtered and recirculated by a pump as in the best systems. One type catches the water at the head and returns it to the disk directly; this type requires only a water spray connection.

The centrifugal system presents a high cost of operation and is not so easy to control efficiently and

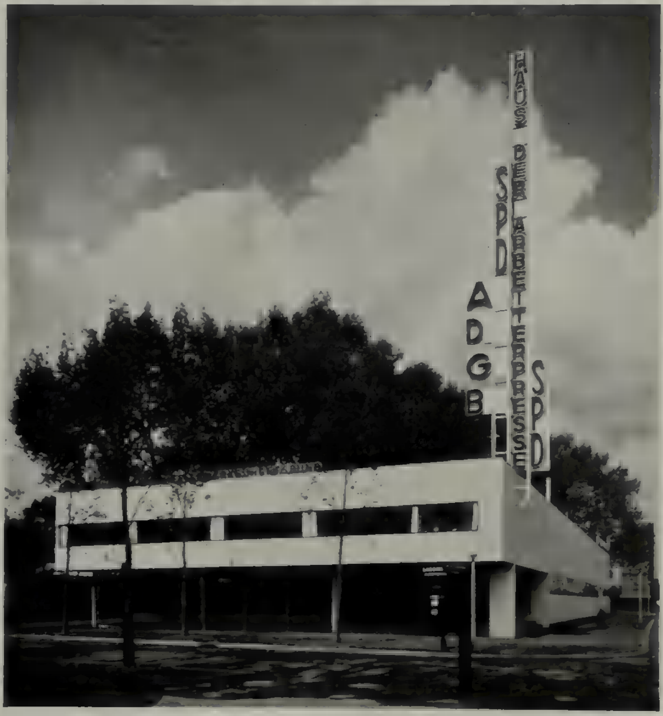
EXHIBITION ROOMS

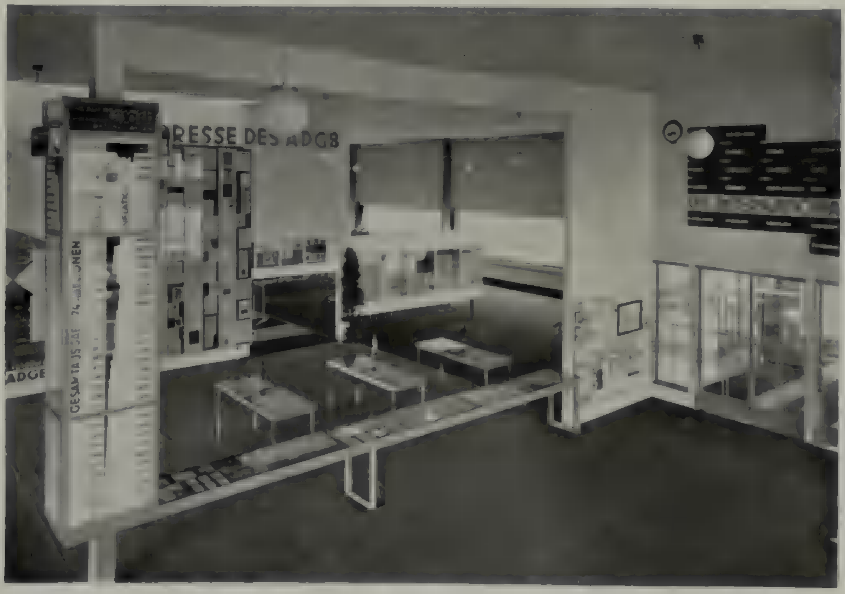
COLOGNE, GERMANY

HANS SCHUMACHER, ARCHITECT



Werner Mantz





Reading, lecture and display rooms of associated German workman's newspapers and trade journals. Visitors seeking information may come here to consult periodicals—an illustration of relationship of the publishing plant to community.

effectively as some other types. These factors are offset, in small installations, by the lack of accessory equipment and by simplicity of installation.

Nature of spray, possible air circulation, ease of cleaning, accuracy of the construction, quality of workmanship in installation, possibility of inspection and repair service are factors to be considered.

Central station

The direct humidifiers do not provide either for control of ventilation or for dehumidification, which are essential for industrial operation and for human comfort. In the central station system a chamber located outside the room tempers the air both in temperature and humidity and delivers it by ducts to desired outlets. Such a system makes possible any desired atmospheric conditions. Ventilation, heating, humidifying, including refrigeration apparatus, dehumidification and cooling are controlled.

A central station system is in most cases more expensive than the other types and should be used only where it is necessary to maintain conditions which cannot be obtained otherwise.

Frequently an elaborate central station system is installed to remedy conditions which occur only on very few days of the year. Weather bureau statistics should be studied to determine the real need for the added features of this system. The extra cost must be balanced against the benefits derived on those days when such features are needed.

SYSTEMS OF DEHUMIDIFICATION

In many cases it will be found important to control the temperature and relative humidity in summer as in winter. In winter the air must be warm and the humidity increased. In summer the air must be cool and moisture content reduced so that both temperature and humidity may be kept constant regardless of outside weather conditions, and of conditions within the plant itself.

Dehumidifiers are of two general types:

(1) Spray type in which the water is cooled outside of the spray chamber and then introduced.

(2) Type in which water is sprayed over the surface of refrigerating coils directly into the spray chamber and the air comes into contact with both the wetted coils and the spray.

Usually dehumidification systems are provided with a dew point control at the apparatus and also a control within the room by either a thermostat or a hydrostat.

UNIT AIR CONDITIONERS

In recent years several manufacturers have put on the market unit air conditioners, small semi-portable central stations. The heater is composed of the heating element enclosed by a casing over whose surface pans draw fresh air and discharge it in selected directions. Some are equipped with automatic temperature and humidity controls, becoming entirely automatic in operation.

Unit heaters are designed to circulate the air at a rapid rate, give a humid temperature, direct rapidly and effectively the heated air, simplify piping and installation, increase capacity of the heating surface by passing the air over it at high velocity, and to control readily the room temperatures manually or by thermostats. They are easily set up and can be moved from place to place.

The unit heaters are well suited to establishments not operating in large rooms. In general, for large rooms a central station system properly designed may be relied upon to operate at lower cost per unit of capacity than an aggregation of relatively small self-contained units.

Conditioning units are particularly good for plants requiring definite air temperature and humidities in various rooms. Trouble with one unit does not cripple other units. Where dust and lint occur, units require frequent attention and cleaning. For dehumidification the A. S. H. V. E. recommends the central station system where more than three unit conditioners would be required.

GENERAL CONSIDERATIONS

Selection and installation of air conditioning equipment requires early consideration with qualified engineers.

The number of employees, the power used, and even the orientation of the building are necessary considerations. The type of window glass may affect radically the control of the relative humidity. Sunlight coming in through windows may raise the room temperature rapidly and thus upset the humidity control. Double glazing and condensation gutters are frequently required. Provision for these requirements should therefore receive early consideration in the planning of the plant.

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FLOORING

Floors should not be fatiguing. At the same time the floors must be able to withstand trucking, acids and severe treatment from accidental dropping of heavy weights. They should be easily cleaned and repaired if necessary, and proof against dust, water, acid action and slipping.

Many printers object to concrete floors as having an affinity for moisture which causes their feet to swell with much standing. Consequently they frequently stand on rubber mats. An untreated concrete surface gives off a fine dust which disturbs the quality of printing and it becomes necessary to paint the floor frequently. These objections can be met satisfactorily by the use of integral surface hardeners. The joints also should be laid diagonally rather than square to the truck routing and filled with asphalt to avoid chipping if not chemically hardened.

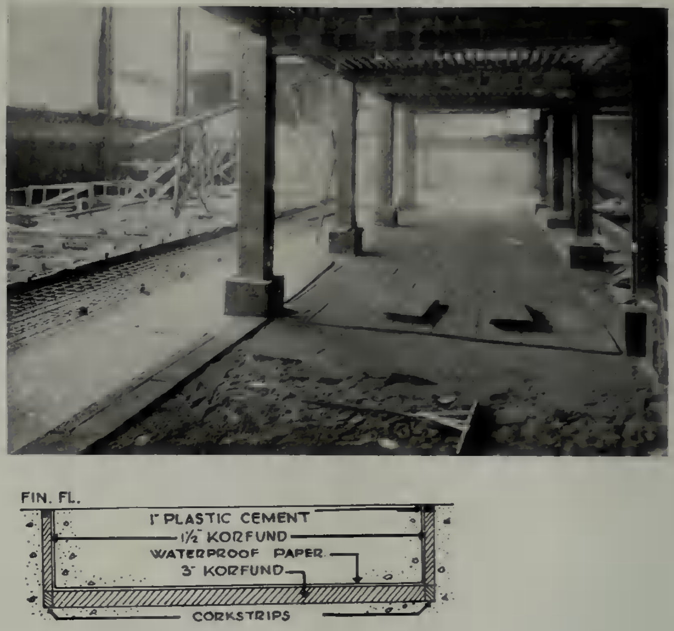
The usual alternatives to concrete are mastic or wood block flooring. These provide a softer finish. Mastic, however, becomes ribbed and uneven under trucking, and thus difficult to clean. In the McMath plant at El Paso, Texas, the concrete floors were covered with asphalt to give a springy resiliency, but it became necessary to remove the asphalt on the trucking passageways. Wood blocks with the end grain forming the surface are resilient, sound-absorbing, and have a lasting smoothness. They are more expensive than either mastic or concrete flooring and when laid on ground floors call for an absolute waterproof medium between the blocks and the floor base to prevent dampness and subsequent swelling and buckling.

A double wood flooring has been found satisfactory in small job plants. The first flooring is nailed to oak planks embedded in the rough concrete at proper intervals and the finished flooring then laid cross-wise. The presses are placed either on the oak planks or on planks bolted to the double flooring. For wood floors there should be a sheet of zinc under each press to catch oil and grease.

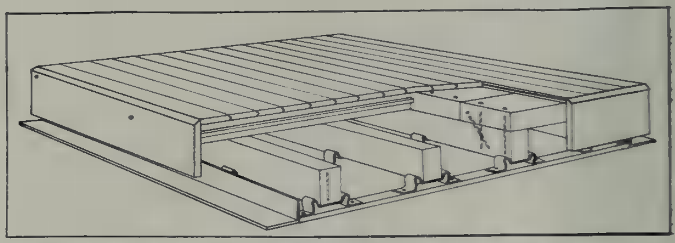
Where concentrated acids are encountered, vitrified brick with tar joints or an alberene stone floor laid on a 5-ply blanket of fabric and asphalt to form a waterproof base can be used. Where dilute acids are encountered, metallic concrete floor hardeners have been recommended.

Where used plates are stacked in the stereotype room to be resmelted, the floor should be strengthened with an arrangement such as a feralun steel plate surface set in the concrete slab.

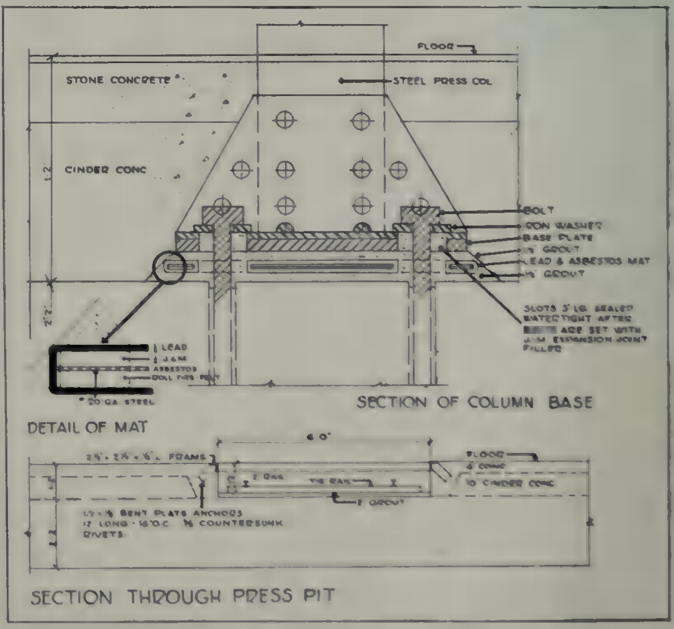
For areas around machinery the floor should be made proof against slipping. Graphite, especially when it comes in contact with concrete, makes the floors very slippery. Metallic floor hardeners are suggested for such conditions.



INSTALLATION OF KORFUND
PITTSBURGH PRESS



VIBRATION PROOFING OF PLATFORMS BY RESILIENT SPRINGS
U. S. GYPSUM COMPANY



DETAIL OF VIBRATION PROOFING
NEW YORK DAILY NEWS
LOCKWOOD GREENE ENGINEERS, INC.

VIBRATION PROOFING

Vibration can cause much trouble with presswork. Quads, spaces, leads and furniture work out of place and plates become loosened if the vibration is not controlled. In dressing castings, for instance, the work must be as close as half of 1/1000″, to accomplish which there can be no vibration. To obtain perfect register of colors, to prevent slurring of the fine dots on halftones, and to minimize wear on the presses, there should be no vibration. Furthermore, for obvious reasons, vibration should not be transmitted to other parts of the building.

Presses are sometimes staggered in plan so that any tendency to set up a swaying motion by synchronization will be counteracted. This is not always feasible and frequently not all the presses will be operating at once to achieve the desired result.

Where presses rest on ground floors, vibration is usually absorbed through foundations separate from those carrying the building loads. Sand bed fills for individual pieces of equipment are sometimes used.

The Milwaukee *Journal* presses have separate foundations on piles and spread footings. One row of press supports overlaps the building footings which support but are isolated by a mat of creosoted poplar encased in sheet lead. This mat is on top of the building footings and below surface water level. Results have been good.

The Goss Printing Press Company recommends as best practice for vibration proofing of press installations either (1) a layer of Korfund placed under the whole area covered by the press and surfaced with a reinforced concrete slab at least 18″ in thickness, or (2) lead asbestos pads placed under the individual columns of the press foundation.

In the Chicago *Daily News* plant, a 2″ layer of Korfund was inserted around the vertical sides of the foundations and the columns, and a 3″ layer of Korfund placed over the bottom of the pit. The press foundations are poured directly on the Korfund, which completely isolates them from the rest of the building. In the Oklahoma Publishing Co., plant a 1½″ Korfund mat was used over the ground slab, the load of the presses being carried on the ground instead of by the building structure.

In the Toronto *Star* press isolation was satisfactorily accomplished with 1½″ thick Armstrong machinery isolation cork, heavy density.

In the New York *Daily News* plant the problem of eliminating vibration was solved by the use of a reinforced concrete slab designed not for strength primarily but for sufficient mass to absorb the vibration of moving parts. The presses are supported by lead and asbestos insulating mats on the reinforced concrete slab which is 26″ thick. On this is a blanket of cinder concrete, covered by a stone concrete finish for the floor. This fill accommodates electric conduits and aids to deaden vibrations. Care should be taken that cinder concrete does not come in contact with any ferrous metal which will be rapidly corroded.

The U. S. Gypsum Company has recently developed a new type of vibration proofing, based on the principle of providing a resilient steel spring between the source of vibration (or sound) and the structural members of the building. This spring base has been recommended by the Miehle Printing Press Co.

The Johns-Manville Company has also recently entered the field of vibration-proofing with anti-vibration platforms for installation under linotype machines and small printing presses where the maximum load is not more than 330 lbs. per sq. ft.

Tests have been made by Frank D. Chase, Inc., engineers, to determine the relative absorption of sound of four different classes of isolation materials for use under printing press foundations. The materials tested:

1. *Natural cork* (1½″ thick, 6″ x 6″, loaded to 20 lbs. per sq. in.)
2. *Lead and asbestos* (lead ⅛″, asbestos 3/16″, lead ⅛″, 4½″ x 4½″, loaded to 50 lbs. per sq. in.)
3. *Lead, asbestos and steel* (lead ⅛″, asbestos 7/32″, steel ⅛″, asbestos 7/32″, lead ⅛″, 4½″ x 4½″, loaded to 50 lbs. per sq. in.)
4. *Balsa wood* (3″ thick, 6″ x 6″, loaded to 20 lbs. per sq. in.)

Each material was loaded to its normal working capacity under a steel bearing plate which carried a suitable load of pig lead. Sound was created by a standard air hammer and reciprocating electric hammer direct to the steel bearing plate over the material. Sound was observed in the frame of the building two stories below and audibly detected through a standard stethoscope.

Two materials were loaded and the sound applied alternately to each and direct to the floor so that relative degrees of sound could be noted. One material was then changed, the tests repeated, and this in turn until the relative difference of each had been compared with the others. The results, the engineers point out, are only approximate, inasmuch as the volume of sound was determined by the differences detected by the ear. The test with scientific instruments would be, of course, more accurate.

Relative sound transmitted direct to floor was taken as loud (100%). Relative sound through lead, asbestos and steel was then determined as medium loud (approx. 60%); through lead and asbestos as medium (approx. 50%); through Balsa wood as medium dim (approx. 20%); and through natural cork as dim (approx. 10%).

STATIC ELECTRICITY

Changes in temperature and humidity conditions are chiefly responsible for static disturbances. While air conditioning will reduce the accumulation of static, it does not, however, remove its presence.

Neutralizers are often necessary to get rid of accumulated static. Especially is this the case in rotogravure printing where the fumes from the inks are highly inflammable and as the copper printing cylinder and the rubber impression roll with the paper between are generators, the static builds up until it discharges to the nearest ground, very often causing flash fires.

ILLUMINATION

Since many printing plants operate both day and night, proper artificial illumination is needed to augment or to replace daylight as it fails. The skilled operators are using their eyes continually on close and careful work which, unless provided for, will cause eyestrain and impaired health. The importance of eye infections as a prevailing ailment has already been noted. Poor illumination is responsible for low efficiency, accidents, low production and a high rate of spoilage.

Ground floor plants with overhead sawtooth roof construction offer a maximum of daylight without glare or shadow. North light is particularly desirable for composition, art work, color matching and printing. It is, of course, not always obtainable. But glare, either direct or indirect, should be avoided. Sunlight streaming in through windows should be subdued with shades of buff or white linen, or white artist's cloth. Windows of ribbed glass assist to diffuse the light where desired and do not require shades.

Proper painting of the interior will assist in diffusing the natural daylight. By actual tests undertaken by various electrical engineers it has been discovered that buff reflects light better than white and is much more comfortable to the eyes. To conceal fingerprints there should be a dado of a darker color—bronze green, dark gray, dark olive green, hospital green or dark brown.

Drop lamps at eye levels are to be avoided. No cords should be dangling over the imposition tables. All lights should be spaced to give a uniform illumination where needed. In particular, units should be placed over each compositors' stand, type cabinet, imposing table and over the inspection tables near the delivery end of each multicolor press.

"Standard" daylight is difficult to determine. In winter daylight becomes dark in value early in the afternoon. Storms and passing clouds also affect daylight. Its color is always changing, owing to either atmospheric conditions or to the reflected light of neighboring objects.

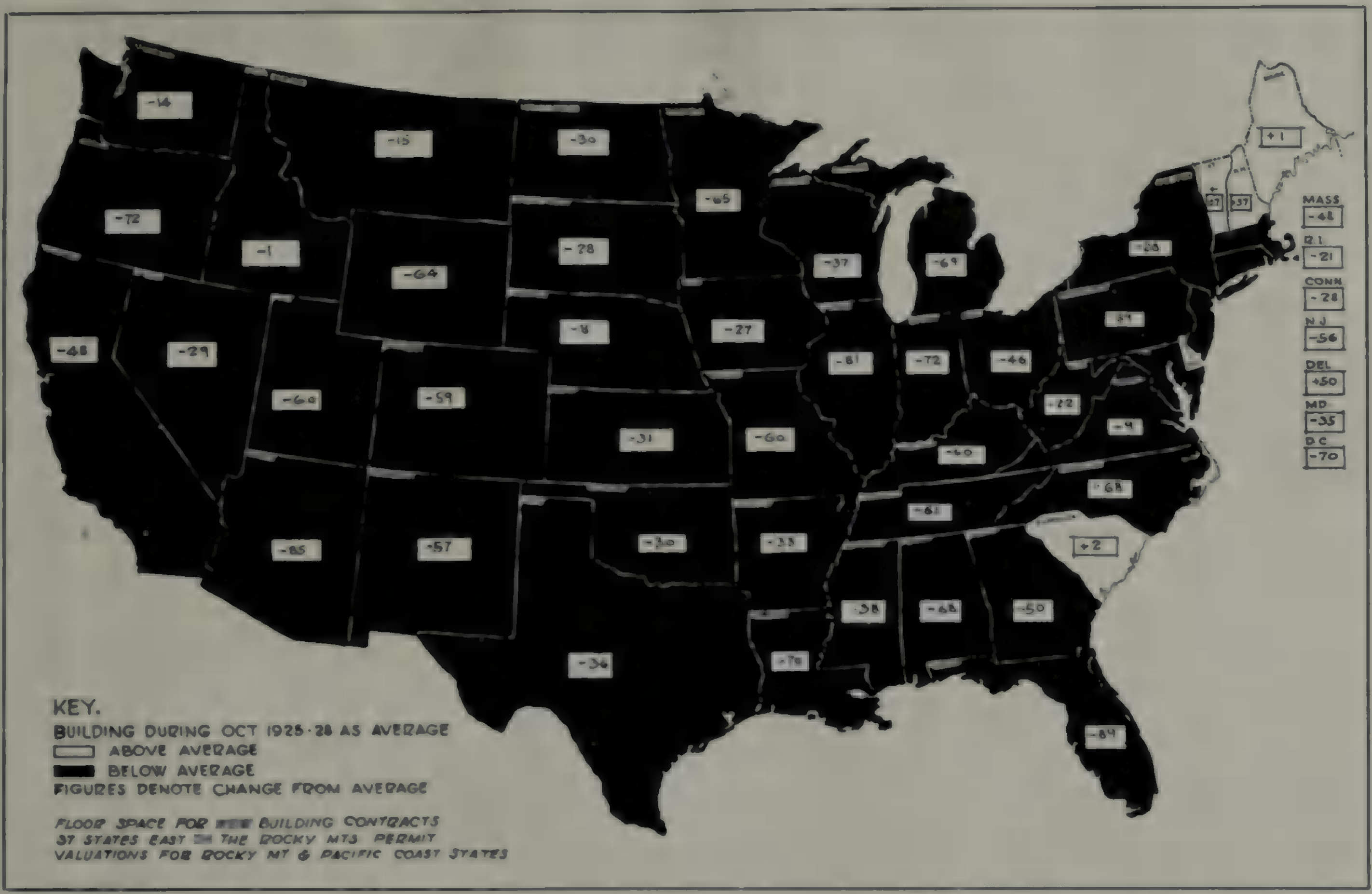
A uniform intensity of artificial north light is more desirable for color matching and multicolor printing than genuine north light. Special daylighting lamps are on the market. Such is the Mazda C Daylight, furnished with suitable reflectors and special filters to give a strong diffused white light. Mercury vapor or Cooper-Hewitt lamps are recommended by many engineers and printers, but others object to the sickly appearance which these lights give to those working under their illumination. Glassteel diffusers and control lenses such as Holophane have been found satisfactory.

The need for research is apparent. At the convention of the Illuminating Engineering Society, held at Richmond, Va., in October of this year, ocular strain was given much consideration. The subject is complicated by physiological and psychological factors which have not yet been reduced to exact measurements. The light reflection factors of acoustical materials, which have a high light absorption, must be considered. Likewise all the substitutes for sunlight, including the ultra-violet rays.

One paper presented before the society by M. Luckiesh and F. K. Moss called attention to the fact that "seeing meters" must be established to determine the quality and quantity of light. *Lighting plus vision equals seeing:* higher levels of illumination enable smaller objects to be seen.

Eyes function only a fraction of the total working time, in split-second intervals. Hand movements, more or less automatic, consume the rest of the time. What can be done to conserve eyesight is a fruitful field of research for the lighting engineer. Much is being done. Tests have been undertaken by Kwan Y. Tang, instructor of electrical engineering at Ohio State University, to compare the rapidity with which a detail of a test object could be perceived under various levels of daylight, incandescent and mercury vapor illumination, alone or in combination. These tests indicate that daylight is the most satisfactory source of illumination, and that next to daylight a mixture of all three illuminations is most successful.

Industrial illumination also suggests the possibility of providing hygienic conditions for both the eyes and the body from ultra-violet transmission. The S-1 lamp, a device combining artificial illumination with the desirable ultra-violet of the mercury arc spectrum, was recently introduced commercially. The Cooper-Hewitt glass tube lamp contains a sufficient amoung of ultra-violet and also has the advantages of containing no wave-lengths short enough to produce deleterious effects on the eyes. A new type of ultraviolet lamp, which can be combined with artificial illumination, is described in another paper by J. W. Marden and M. G. Nicholson, Westinghouse Lamp Company. This lamp is of the low-pressure mercury glow discharge type.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KEY.
BUILDING DURING OCT 1925-28 AS AVERAGE
ABOVE AVERAGE
BELOW AVERAGE
FIGURES DENOTE CHANGE FROM AVERAGE
FLOOR SPACE FOR [redacted] BUILDING CONTRACTS
37 STATES EAST [redacted] THE ROCKY MTS PERMIT
VALUATIONS FOR ROCKY MT & PACIFIC COAST STATES

The October building map showed no important changes from the conditions reported in September, though better current new building in New Hampshire, added to continued improvement in Maine and Vermont, indicated a contiguous area in northern New England that was above average (October, 1925-1928).

BUILDING TRENDS AND OUTLOOK

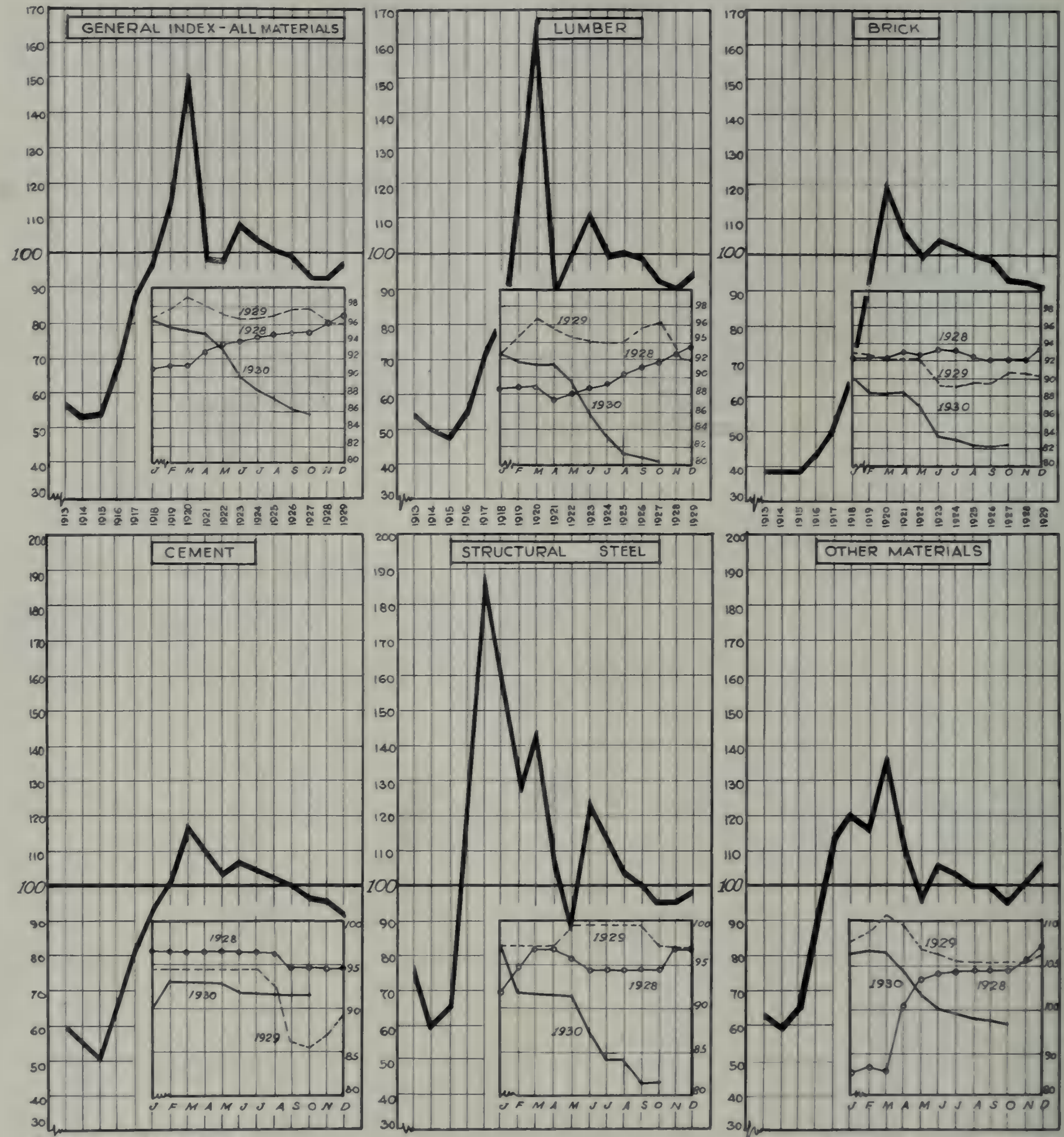
THE ARCHITECT AND CONSTRUCTION ECONOMICS

The architect who plans without regard for construction economics, prospective labor and material costs, land values, financing, technologic improvements, shifting centers of commerce and habitation, taxation, rentals—must go the way of the physician who prescribed before diagnosis. Too willing have we been to accept our plight as an unavoidable phenomenon, too willing to ascribe the causes to the stock market debacle or to tight money, high wages, high material prices. Yet the antitheses now with us have not provided the looked-for improvement. Even though small in numbers the architectural profession is a key one when compared with our other professions. It ministers to the most basic of all manufacturing industries, for building in its true sense is a manufacturing process. All business and industry awaits a prognosis from the building industry. Architects, individually and collectively, are providing this prognosis if we may judge from their growing interest in their own problems. Vertical transportation which has made the skyscraper possible is being adapted to residential requirements. And in the offing even larger apartment houses, with community gardens, swimming pools, tennis courts, and the like seem presaged. Fabricated units, under the direction of the architect, will make possible the erection of more livable small houses, better in construction, at substantially lower unit costs, operating to make obsolescent the row house of an earlier day. Though standardized, these units will be fabricated with due regard to the important matter of community grouping. In this movement the pitch roof will give way to the flat roof terrace with solarium, and glass may become a more important material. These are merely indicative of a tendency towards greater improvements in architecture and

(Continued on page 90 advertising section)

WHOLESALE PRICES FOR BUILDING MATERIALS

1926 Monthly Average = 100



*Data from U.S. Dept of Labor

The general index of building material prices of the U. S. Department of Labor showed a still further decline in October but the rate of decrease seemed somewhat arrested. Of the individual materials lumber showed the principal decrease; brick recorded a gain as compared with the preceding month; while cement and steel were unchanged from September.

It is variously estimated that construction costs in general are from 13 to 20 per cent below prevailing costs a year ago if due allowance is made for increased productive efficiency on the part of building tradesmen. In the meantime money for needed building projects is plentiful and interest rates remain low.

Applied six years ago . . .
Washed twice a year since . . .
Lustre unimpaired

Cambridge Arms, Charles, 34th and St. Paul Streets, Baltimore, Md.—a property of The Guilford Realty Company. All seven Guilford Apartment Houses here shown are painted with Barreled Sunlight.

First Guilford Apartment House painted with Barreled Sunlight

Readily tinted any desired shade with ordinary colors in oil. Quantities of 5 gallons or over are tinted to order at factory without extra charge.

Three more Guilford Buildings all painted with Barreled Sunlight

Dundee Arms

Essex Arms

Berkeley Arms

IMPRESSIVE enough when this prominent Baltimore real estate operator specifies Barreled Sunlight for six apartment houses and an apartment hotel.

Doubly impressive when such standardization is the result of six years of satisfactory performance in the first of these—the Cambridge Arms.

The reasons for this preference are outlined in a letter too long to reprint. Extracts, however, tell the story:—"washed in some instances twice a year . . . lustre unimpaired . . . the general appearance truly wonderful."

Though our complete catalog is in Sweet's, we'd like to supply more detailed information for your own personal files. Please mail the coupon.

U. S. Gutta Percha Paint Co., Providence, R. I. Branches or distributors in all principal cities. (For Pacific Coast, W. P. Fuller & Co.)

Another Guilford Apartment painted with Barreled Sunlight

Tudor Arms

Two more Guilford Buildings also painted with Barreled Sunlight

Wentworth Arms

1001 St. Paul St.
(Apartment Hotel)

U. S. Gutta Percha Paint Co.,
22-L Dudley Street, Providence, R. I.

Please send me your booklet, "Information for Architects," and a panel painted with Barreled Sunlight. I am interested in:

Gloss ☐ Semi-Gloss ☐ Flat ☐

Name______________________________

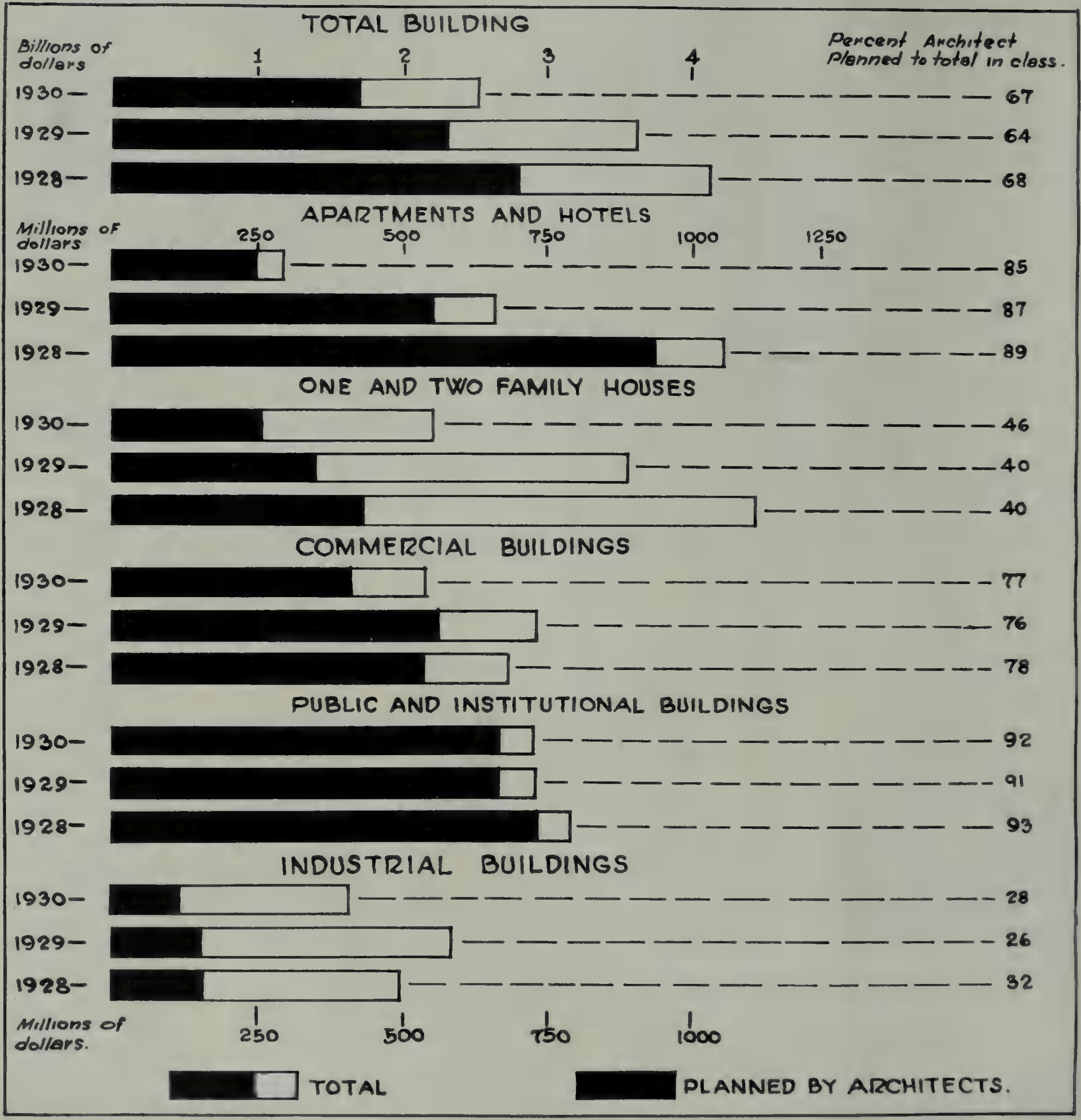
Street______________________________

City_______________State____________

BUILDING CONTRACTS IN 37 EASTERN STATES

First nine months 1930 with comparisons for corresponding periods of 1929 and 1928

SHOWING, BY PRINCIPAL TYPES, RELATIONSHIP BETWEEN VALUATION OF ALL BUILDING CONTRACTS AND THOSE WHICH WERE ARCHITECT-PLANNED



Though new building showed a drastic curtailment during the first nine months of 1930 when compared with the corresponding period of 1929, work planned by architects has shown a relative gain in importance over 1929. Each important class of building participated in the relative improvement except apartments and hotels which showed architect-planned work with a lower percentage to total apartment and hotel building than was registered in 1929. The percentage of all work done by architects during the nine elapsed months of 1930 showed a poorer condition than was reported for the corresponding period of 1928, increased relative importance of architect-planned one and two family houses being somewhat more than offset by declines recorded for apartments and hotels, commercial, public and institutional, and industrial buildings.

NOTE: Public and institutional buildings include such architect-planned buildings as are reported under public works; other public works construction is not included since this type of construction is principally civil engineering.

New locked sill-joint is one more reason why architects specify "Andersen" . . . .

New Andersen Master Casement, inswinging or outswinging. Note trade-mark die cut in the sill.

Andersen inswinging Casement installation

ANDERSEN'S new Master Frame with the new patented weathertight features already has won first rank with architects. They like the locked sill-joint, the wide blind stop provision, the accurate millwork and the beauty of the genuine white pine which lasts a lifetime.

Also, they know that builders cut labor costs with this new frame. Andersen Master Frames are made so accurately that builders make one operation of fitting all sash and cutting all trim at the bench. Have you received your copy of Andersen's new catalog, No. 500? Write for it.

Andersen Frame Corporation, Bayport, Minn., represented by 3,500 leading jobbers and dealers.

Andersen MASTER WINDOW and DOOR Andersen FRAMES **Frames**

FOR WEATHERTIGHT INSTALLATIONS—USE ANDERSEN SPECIFICATIONS

(*Continued from page 524, Editorial Section*)

measurable changes in the utilization of materials.

The architect is as truly the building designer as the automotive engineer is the automobile stylist. His is the problem of changing and improving the character of architecture so effectively as to make obsolete existing structures; his is the problem of providing better and more livable habitation, more efficient offices and school buildings. It is indeed no easy matter, but in times such as these, when staffs are not under pressure on current plans, unexcelled opportunities are present for the development of efficiency that must bring about a much more methodic evolution in architecture in the light of construction economics than has obtained hitherto.

An examination of the accompanying chart at once discloses the position of the architect in building or what is more significant to him, the large importance of private plans. For all types of building, architect-planned projects have averaged less than 70 per cent of total new building even during the years of largest building volumes, with private plans representing more than 30 per cent of the total. Private plan work, which has bulked very large in one- and two-family houses, provides an answer, though by no means the only one, for the helter-skelter, hit or miss developments which were so prolific during the past few years; shelter—but at what price!

Shelter represented by apartments and hotels, on the other hand, has been most largely architect-planned, but even here a considerable amount of building still is from private plans, more especially in smaller apartments. For the first nine months of 1930 architect-planned apartment houses and hotels were less important relative to total new building projects of these types than in either the corresponding period of 1929 or 1928, which would seem to indicate an increased relative amount of small apartment house construction from "stock" plans. At the same time architect-planned one- and two-family houses showed a large gain in importance when compared with 1929 or 1928, reflective of the less drastic curtailment in the more expensive types which customarily are entirely architect-planned.

Commercial building types planned by architects during the first nine months of 1930 have shown only slight change in importance when compared with either the preceding year or the corresponding nine months of 1928. For the nine elapsed months of 1930 architect-planned commercial buildings were 77 per cent of the total and compared with 76 per cent in 1929 and 78 per cent in 1928.

Public and institutional building has for the most part always been architect-planned. Architect-planned work in this class for the first nine months of 1930 showed a percentage of 92 to the total for the class, as against 91 per cent in 1929 and 93 per cent in 1928.

Industrial building planned by architects showed only 28 per cent of the total for the class during the first nine months of 1930; in 1929 the ratio of architect-planned work was 26 per cent while in the corresponding nine months of 1928 the ratio was 32 per cent. This class of building is principally planned by engineers, hence the low percentages for architect-planned projects.

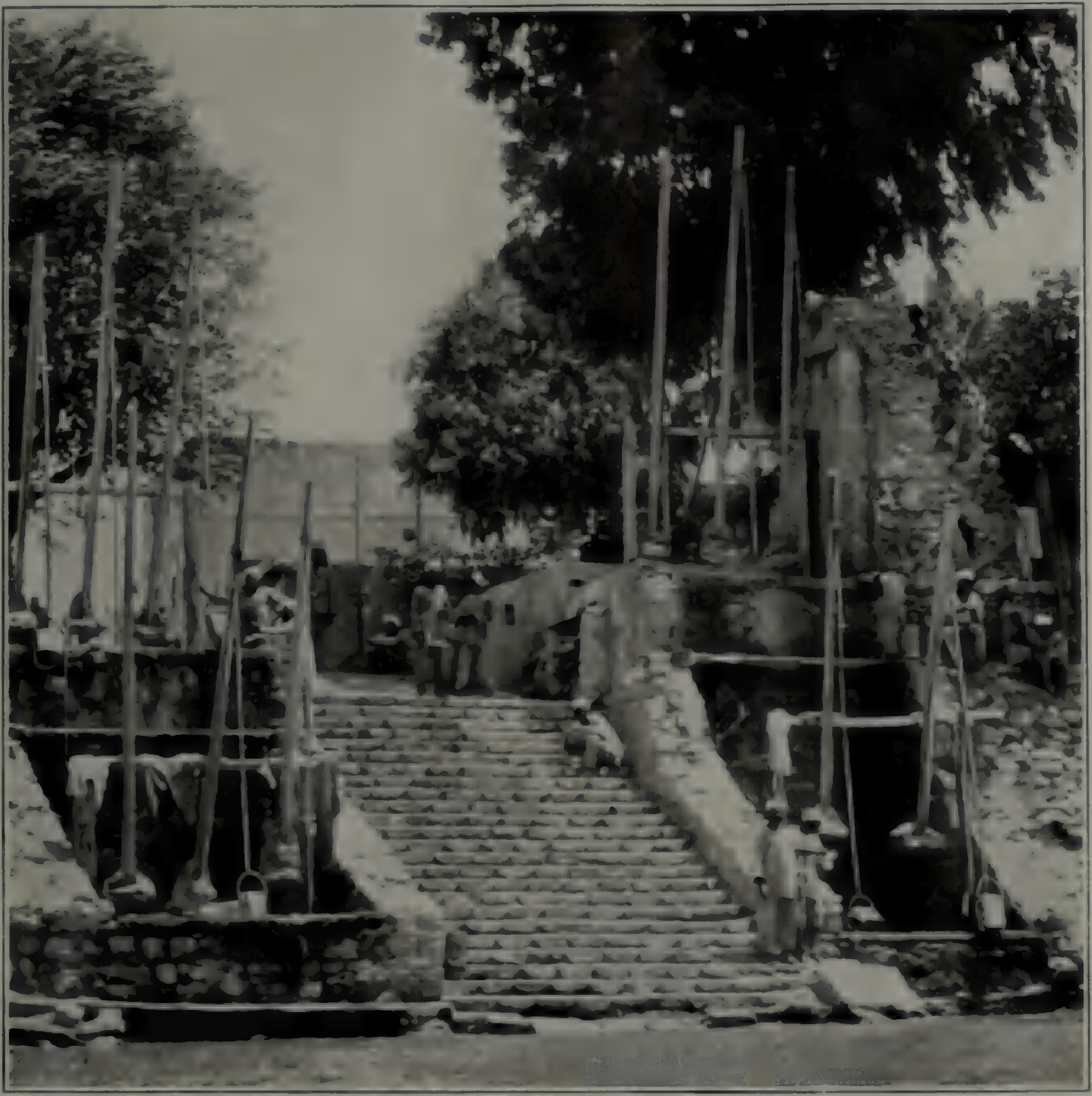
It is upon non-residential building that architects seem to have centered their energies for improvement in design, efficiency in operation, economies in production. With an indicated further decline in this type of building activity because of the known large oversupply in office space, it would appear that the attention previously directed to non-residential building may now well be diverted toward improvements in residential types, to make houses more habitable, to make dwelling units more efficient. In these processes residential building will find basic soundness for continued improvement, for it is not more housing that is needed but rather better housing. The best way to create a demand for new housing is to produce better housing for less money.

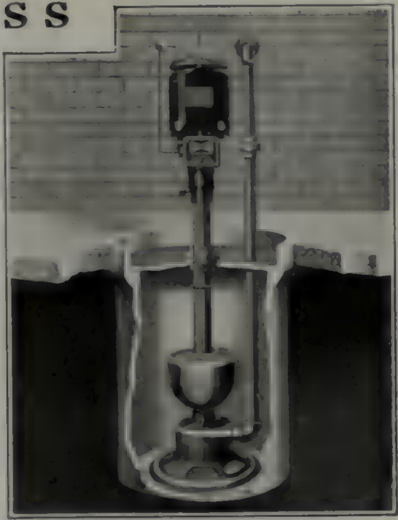
What is being done in this direction is evidenced in apartment house construction in the outer fringes of some of our industrial cities. But development along these lines operates to add dwelling units without material displacement of existing units. The bigger problem involves, it would seem, displacement of obsolescent, walk-up tenements in our slums and near slums which have outlived their economic utility; the rebuilding of existing centers rather than further horizontal extension unless such extension involves some displacement. Here the architect can do no more than advise, but coordinated effort in this direction, with growing recognition of the problem on the part of real estate interests, zoning commissions and financing agencies, tangible results may soon appear. Shelter still is one of the basic needs of civilization. New and better shelter at lower costs can produce a whole train of productive processes in mine and forest, industry and commerce that will restore equilibrium to our complex business machine.

These processes, as cause and effect, will reestablish the architect on an even higher plane in the industry which more than any other, except agriculture, has been fundamental to economic well-being. Out of this must come better design; superior economic utilization of land, environment, materials; and a fuller realization of the possibilities of an untapped housing market. Such will reawaken dormant financial interests—the insurance companies, our savings banks, our mortgage houses and building and loan organizations, to say nothing of private capital of individuals. These reservoirs of money, now brimful, will be released to one single utility which more than any other can restore the balance to our economic machine that has been upset largely by ruthless excesses of which shelter at any cost was not the least impelling.

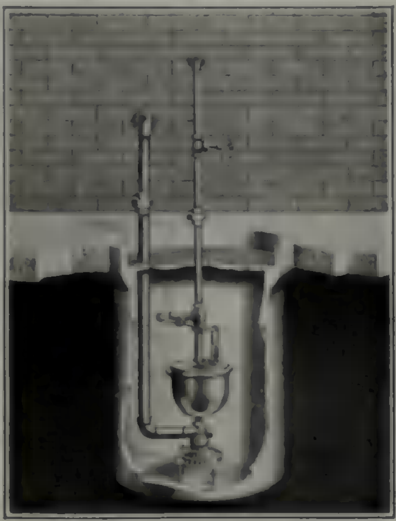
L. Seth Schnitman

CONTRASTS IN INDUSTRIAL PROGRESS





Many architects specify these Penberthy Pumps for draining seepage water from basements, elevator pits, piping tunnels, etc.



Lifting water from the River of the Pharaohs

Along the Nile they call these Shadufs, and they use them for elevating water into the irrigation ditches. At this particular point the Shadufs have to be operated in two stages even though the "operating head" is not more than 15 feet.

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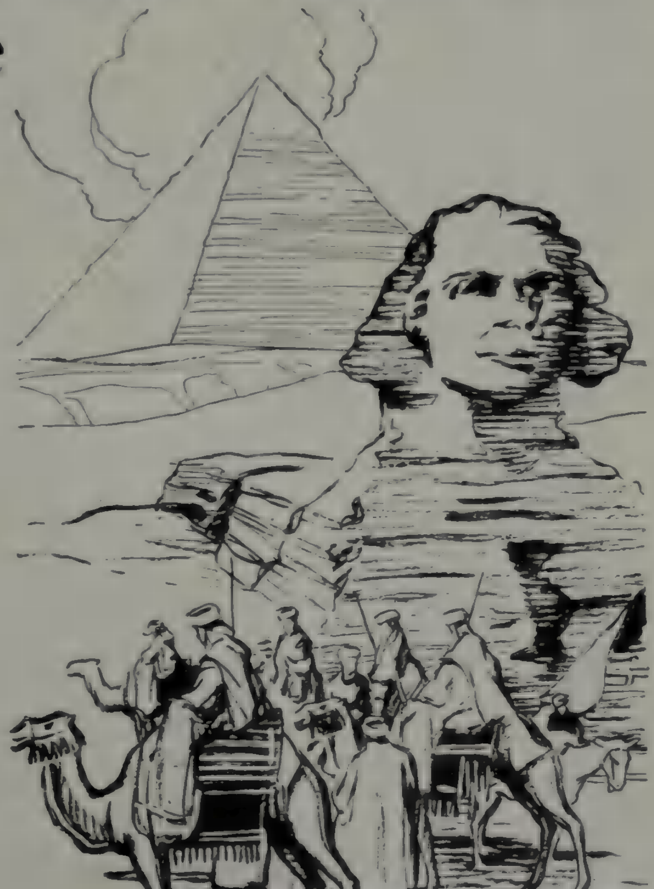

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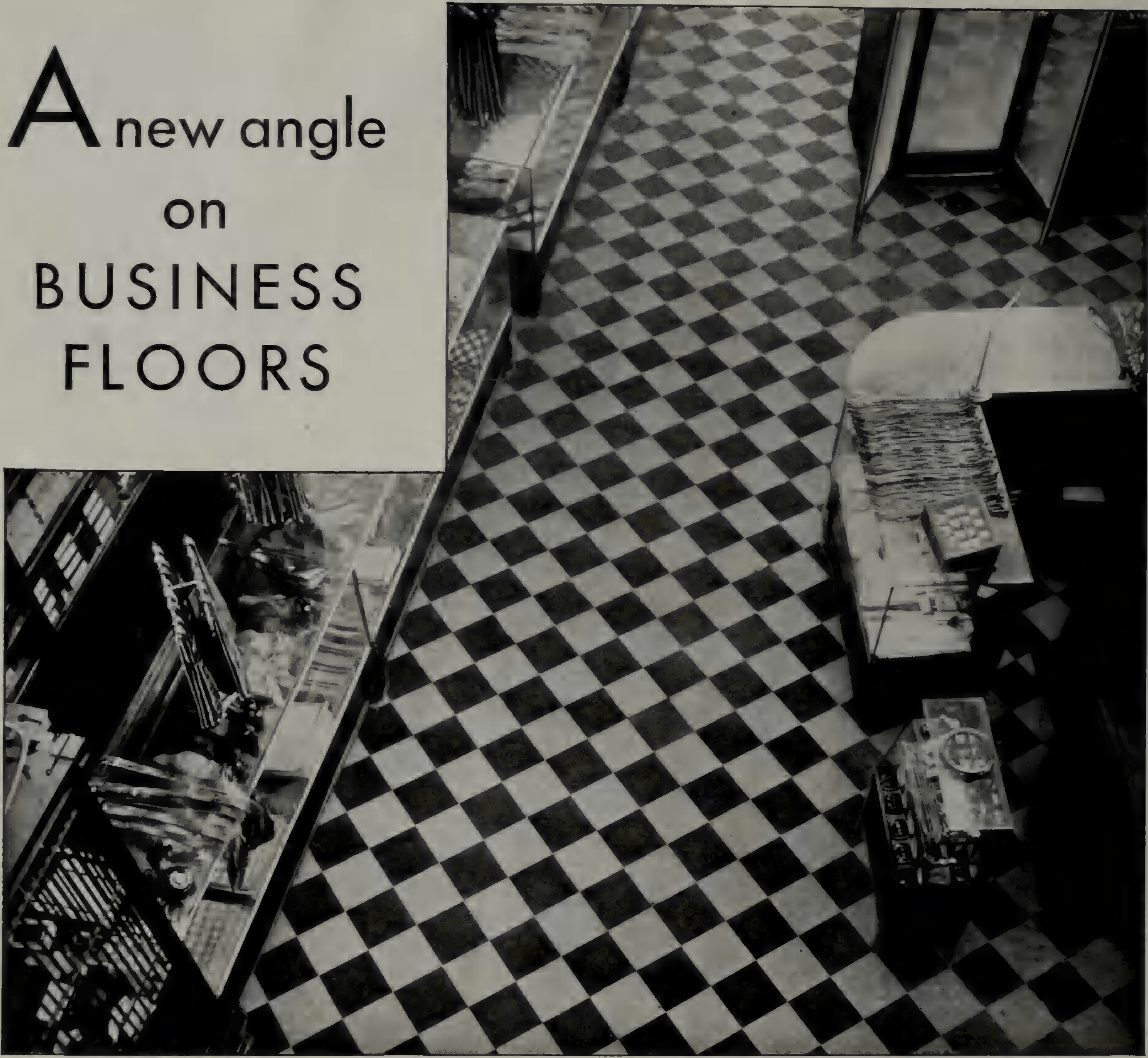

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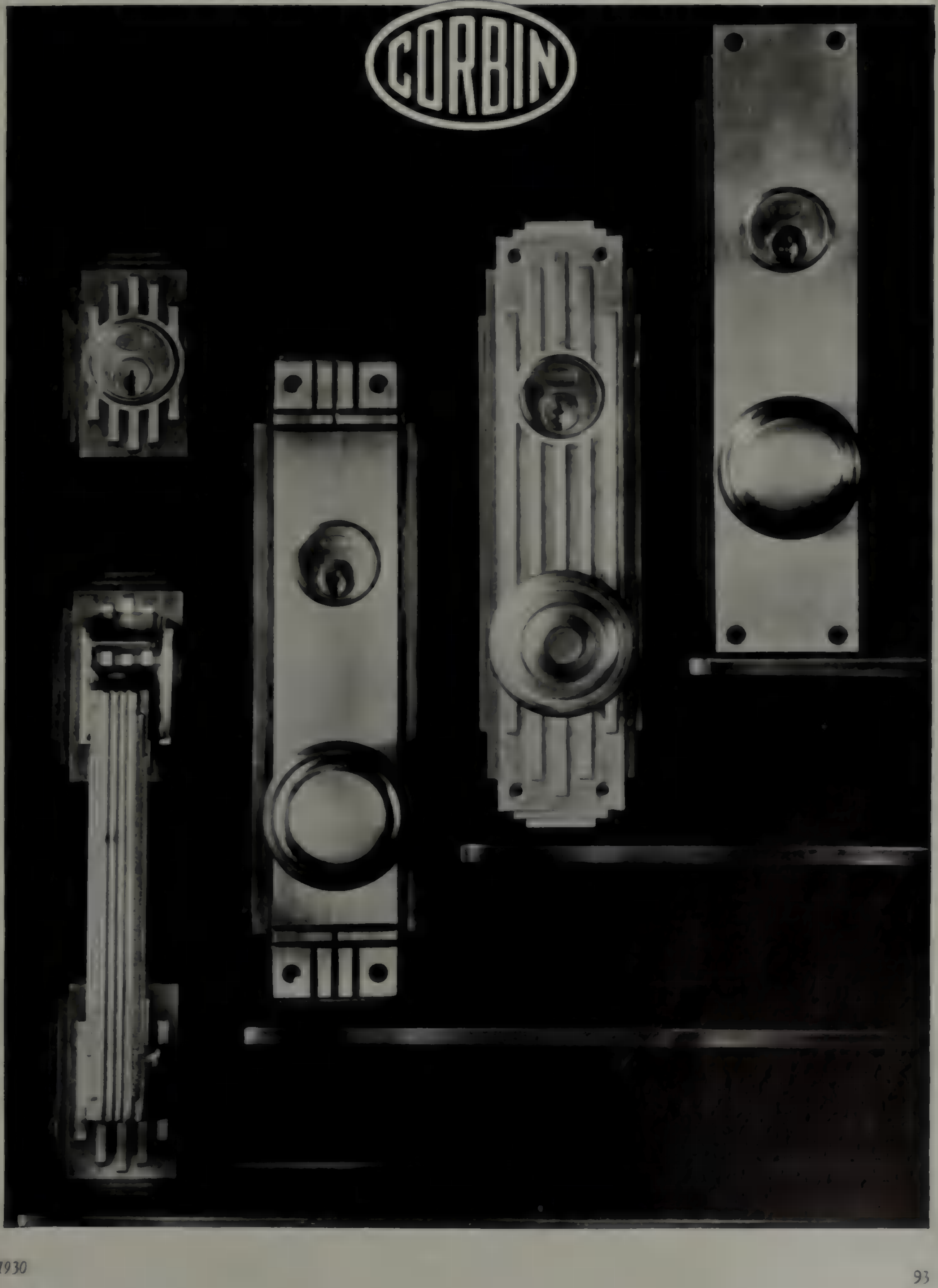

Photographed are (left to right) "Vertex" door handle, "Gargan" knob and escutcheon, "Vertex" knob and escutcheon and "Gotham" knob and escutcheon.

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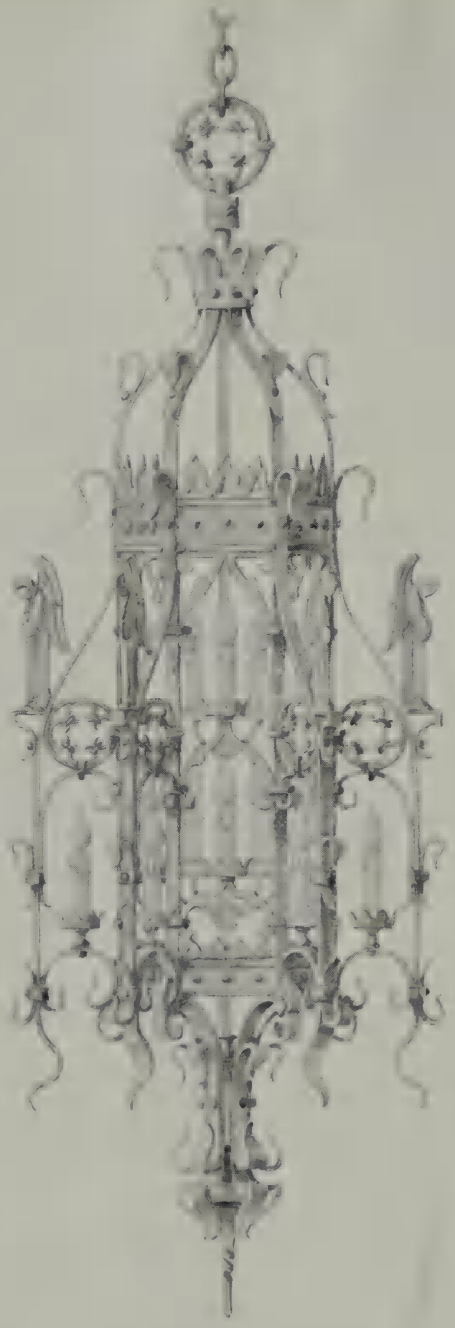

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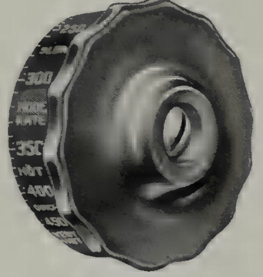

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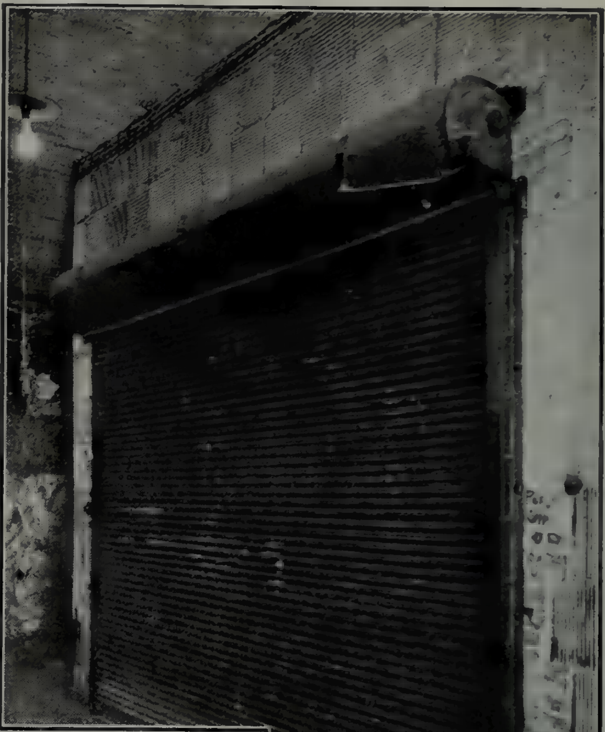

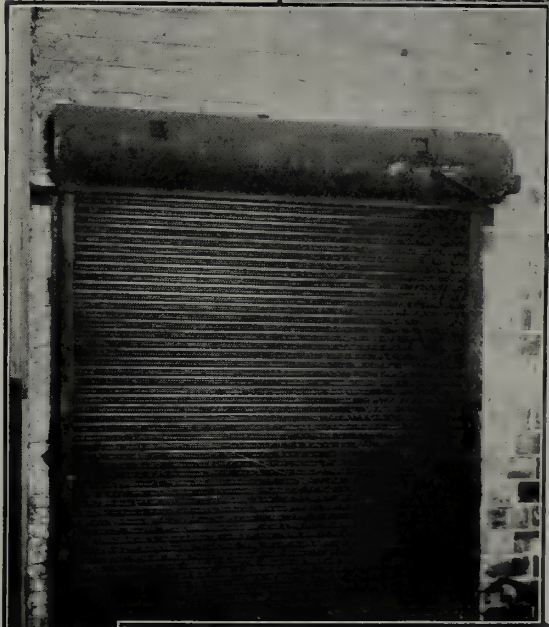

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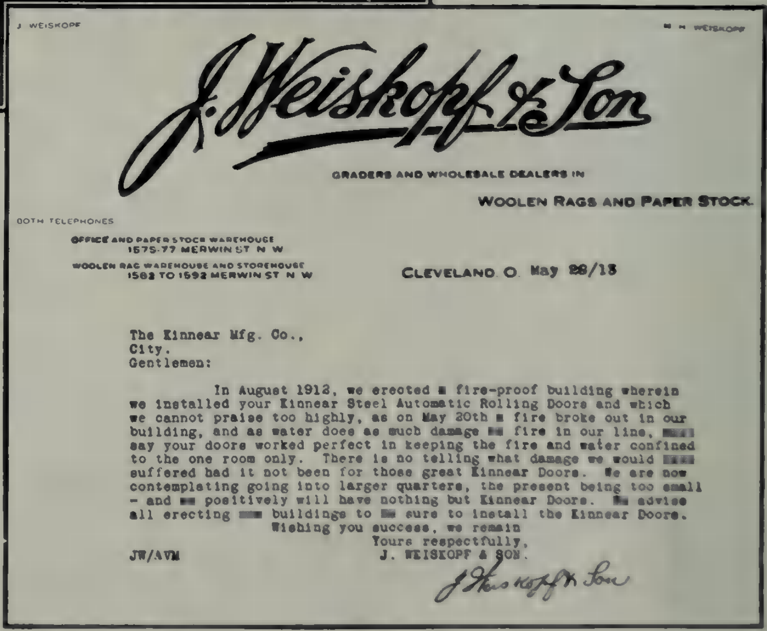

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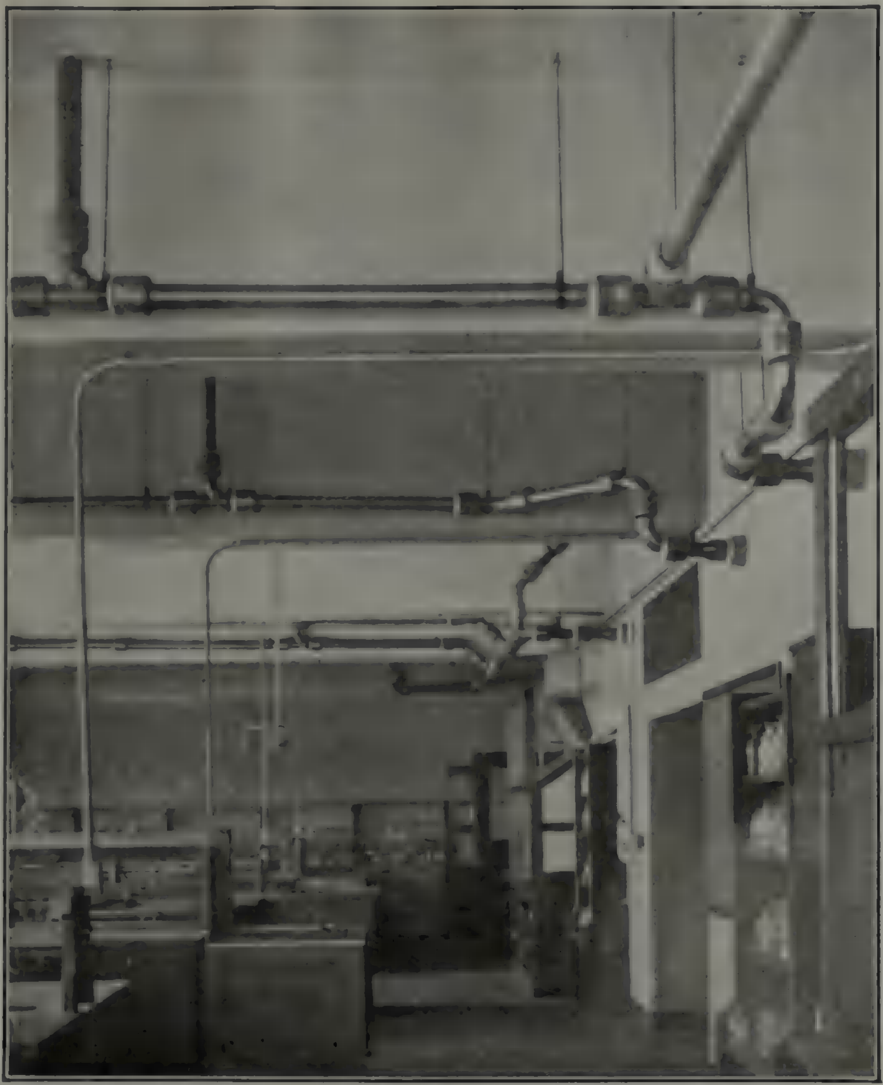

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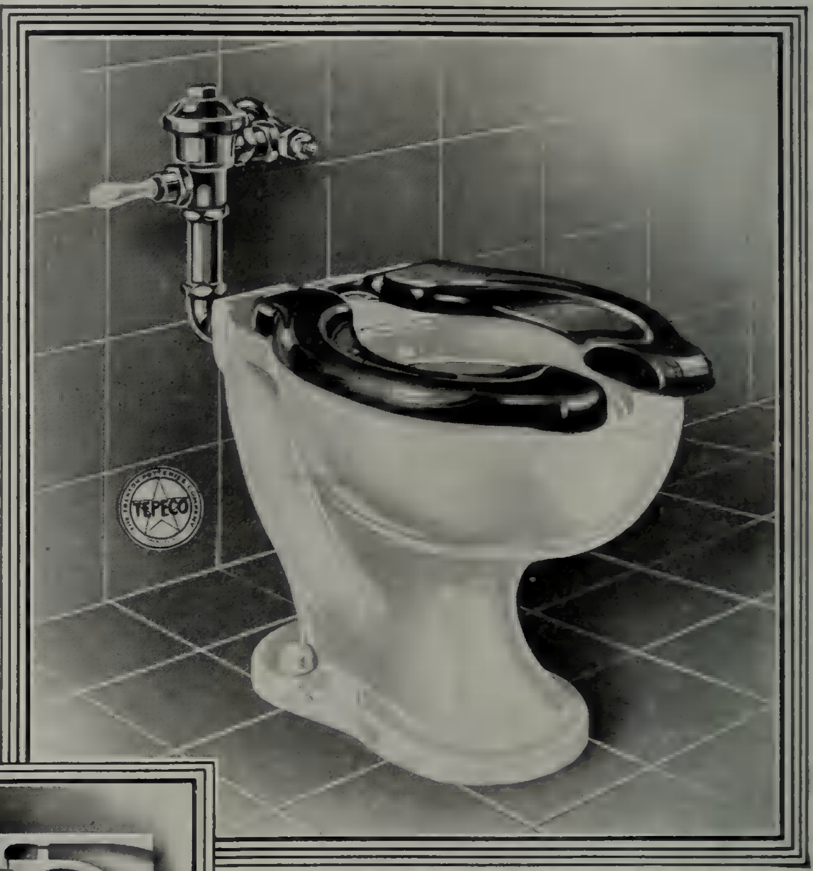
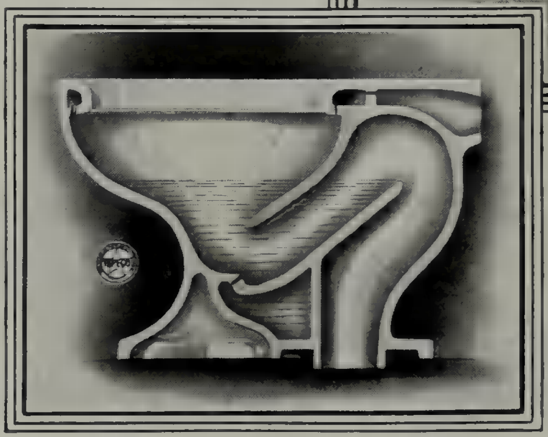


Plate 4521-T—Back Supply Speedway Equipped with Flush Valve. Other models shown in Catalogue.



Details of construction, showing large water surface and unobstructed passageway.

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Ulhlein Job	Milwaukee, Wis.
Grand Riveria Theatre	Detroit, Mich.
Providence Gas Service Bldg.	Providence, R. I.
Wilson Theatre	Detroit, Mich.
New York Herald-Tribune Bldg.	New York City, N. Y.
Arcade Bldg.	Asheville, N. C.
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Sunbury Converting Works	Belvidere, N. J.
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Florence Critterton Home	Detroit, Mich.
Parochial School	Yeadon, Pa.
Nurses' Home, St. John's Hospital	St. Louis, Mo.
Texas & Pacific Hospital	Marshall, Texas
St. Thomas Hospital	Akron, Ohio
French Broad Hospital	Asheville, N. C.
Children's Ward, Tuberculosis Hosp.	Wallum Lake, R. I.
Yankee Stadium	New York City, N. Y.
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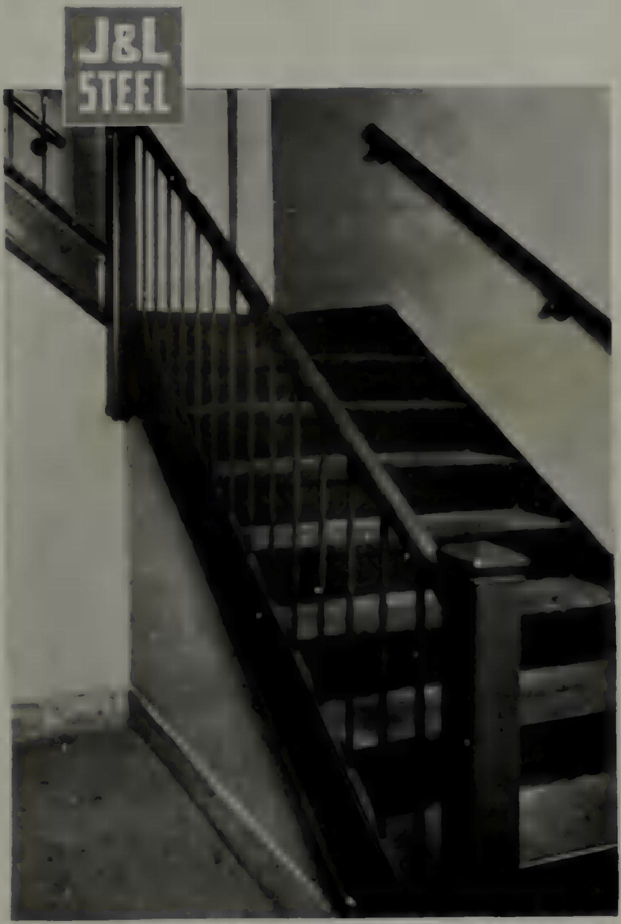

A common type of Stair Installation in which J&L Light Weight Channels are used as stringers.

Above: Central Depositors Bank Building, Akron, Ohio. Architects: Walker and Weeks. Contractor: The Carmichael Construction Company. Fabricator of stairs: The Ornamental Iron Work Company.

Below: Chicago Stadium, Chicago, Ill. Architects: Hall Lawrence and Ratcliffe. Contractor: J. W. Snyder. Fabricator of stairs: Manton and Smith Co.

Above: Johns Hill Junior High School, Decatur, Ill. Architects: Brooks, Bramel and Dague. Contractor: Roy W. Christy. Fabricators: Gandy and Earp.

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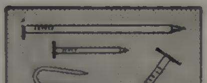

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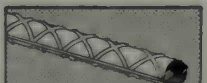

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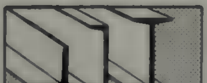

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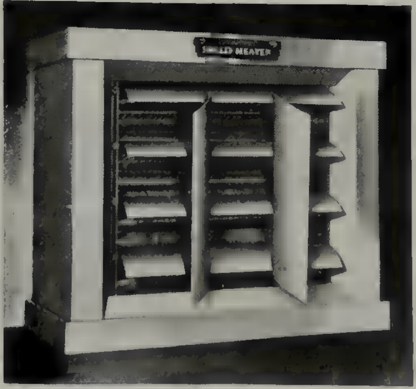

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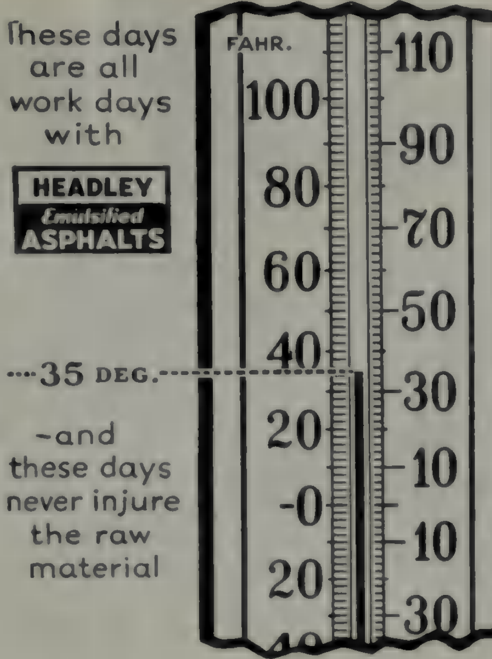
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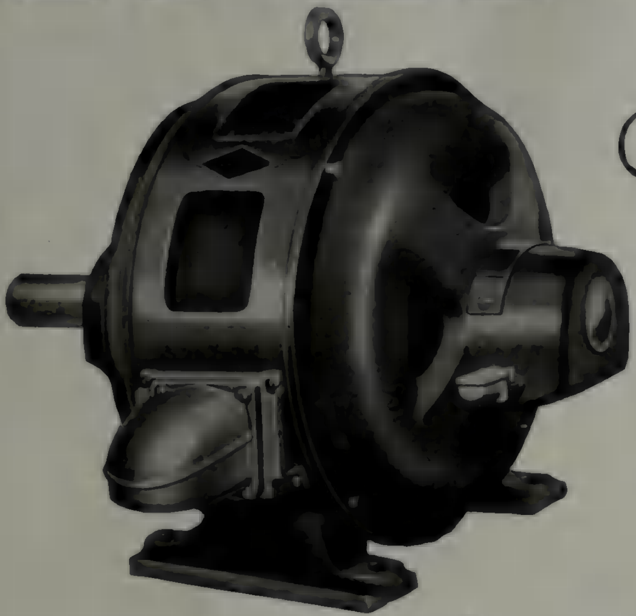

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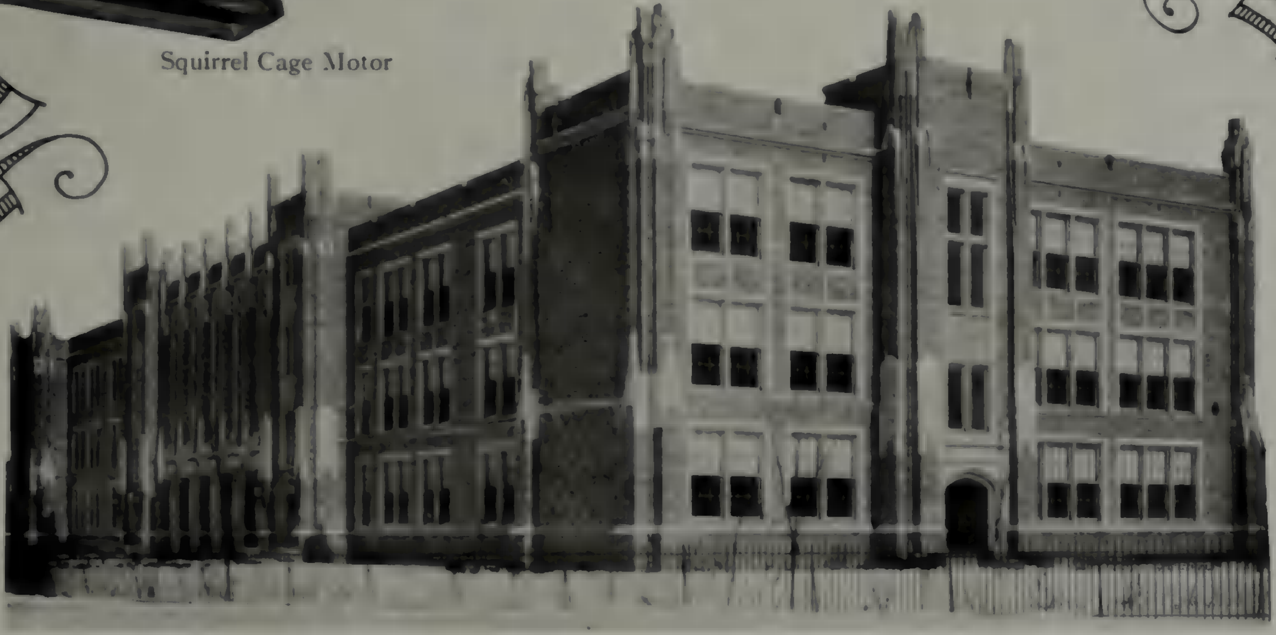

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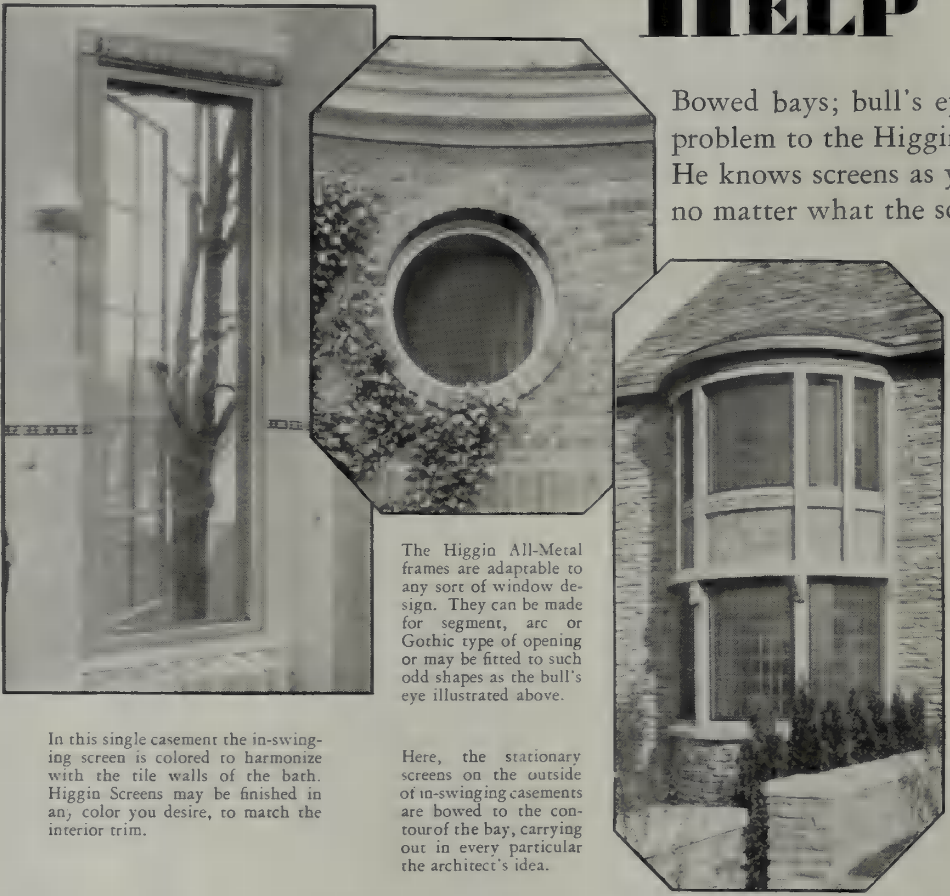

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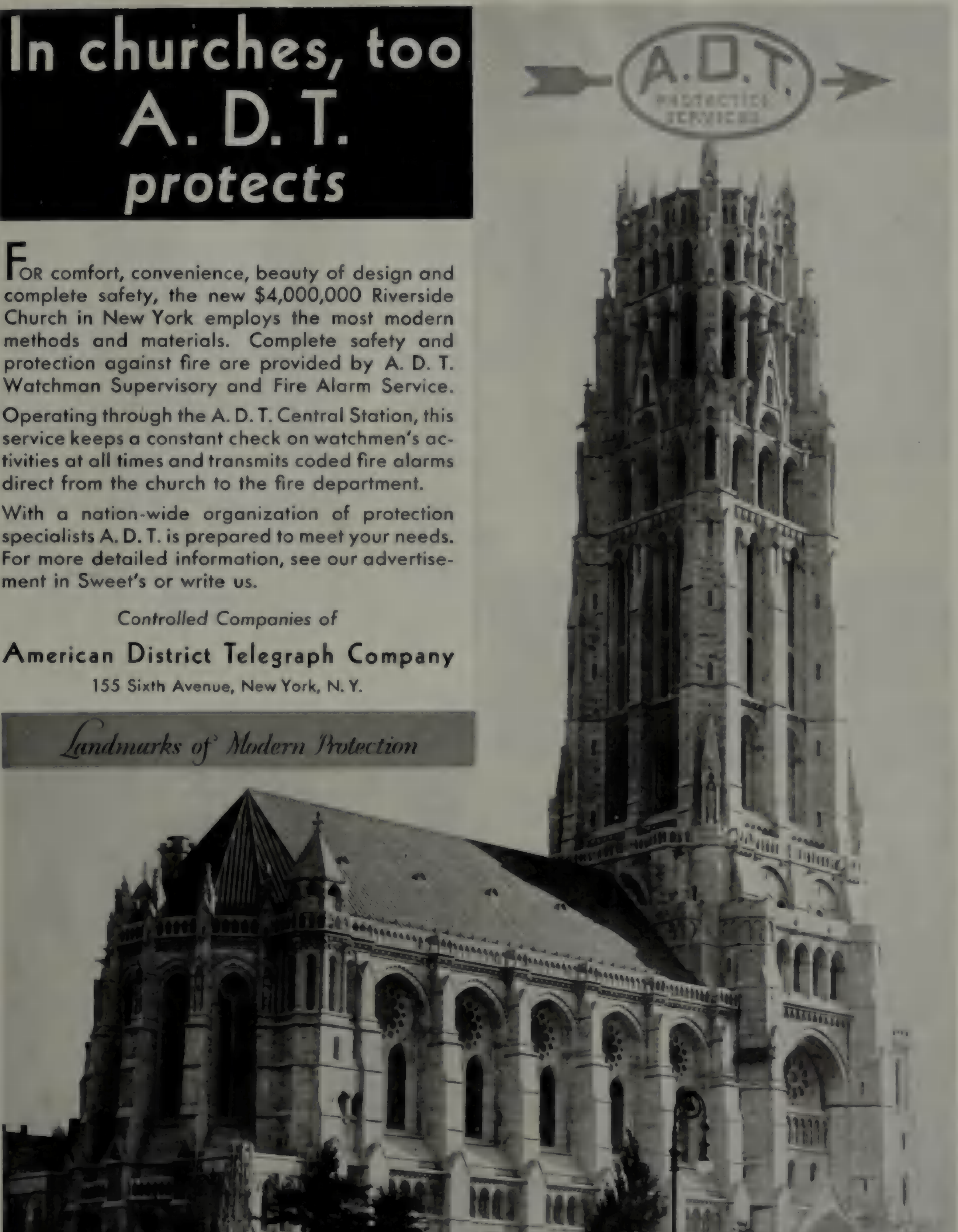

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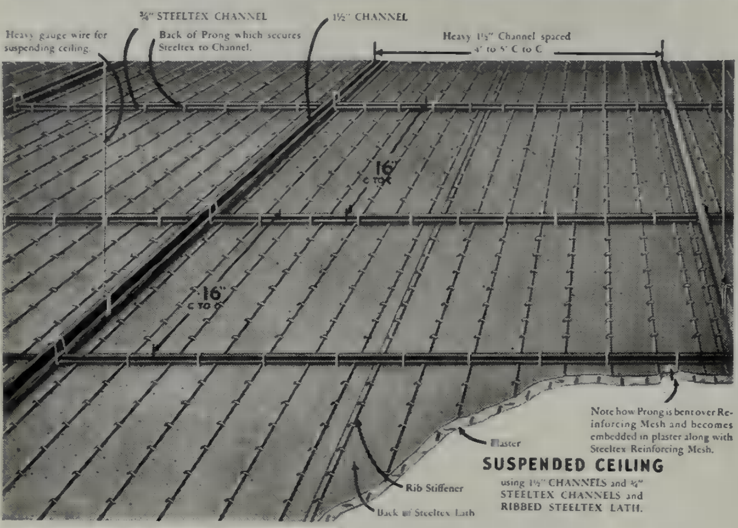
STEELTEX
SUSPENDED CEILINGS

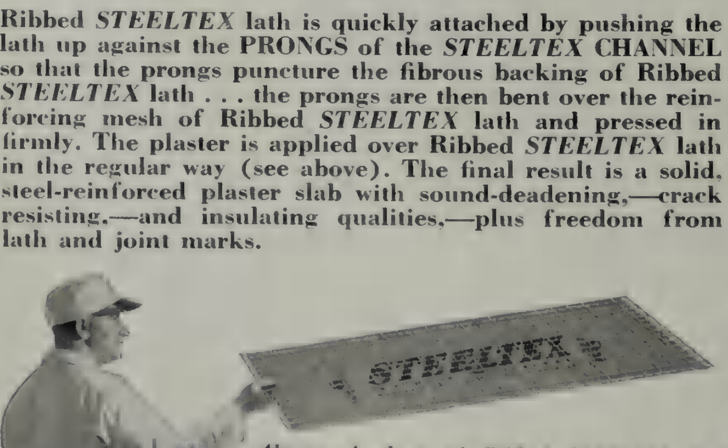

¾" STEELTEX CHANNEL
1½" CHANNEL
Heavy gauge wire for suspending ceiling.
Back of Prong which secures Steeltex to Channel.
Heavy 1½" Channel spaced 4' to 5' C to C
16" C TO C
16" C TO C
Note how Prong is bent over Reinforcing Mesh and becomes embedded in plaster along with Steeltex Reinforcing Mesh.
Plaster
SUSPENDED CEILING
using 1½" CHANNELS and ¾" STEELTEX CHANNELS and RIBBED STEELTEX LATH.
Rib Stiffener
Back of Steeltex Lath

Above: A view looking down on STEELTEX SUSPENDED CEILING construction. The Rib Stiffeners (as shown) give board-like rigidity to Ribbed STEELTEX lath,—are part of Ribbed STEELTEX lath and run lengthwise across the back of every sheet. The galvanized wire fabric on the plaster side of Ribbed STEELTEX lath becomes embedded in the plaster slab as illustrated.

Plastering STEELTEX SUSPENDED CEILING, State Armory, Erie, Pa. Joseph F. Kuntz, Architect, Pittsburgh, Pa. Lee Stearns, Plastering Contractor, Erie, Pa.

The modern way to build suspended ceilings from floor slab, arches, pan system or other similar floor construction is to use the *STEELTEX* SUSPENDED CEILING SYSTEM.

Ribbed *STEELTEX* lath is quickly attached by pushing the lath up against the PRONGS of the *STEELTEX* CHANNEL so that the prongs puncture the fibrous backing of Ribbed *STEELTEX* lath . . . the prongs are then bent over the reinforcing mesh of Ribbed *STEELTEX* lath and pressed in firmly. The plaster is applied over Ribbed *STEELTEX* lath in the regular way (see above). The final result is a solid, steel-reinforced plaster slab with sound-deadening,—crack resisting,—and insulating qualities,—plus freedom from lath and joint marks.

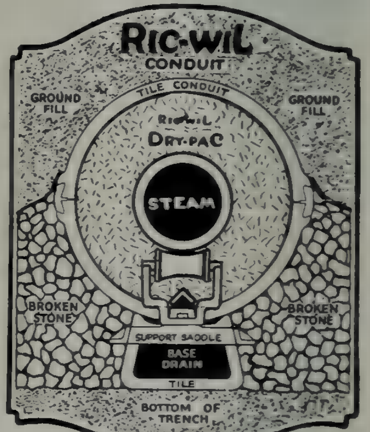


Above: A sheet of Ribbed STEELTEX lath (plaster side showing galvanized reinforcing mesh). The Rib stiffeners run across the back of Ribbed STEELTEX lath and give every sheet its board-like rigidity during plastering.

Write for FREE descriptive literature about *STEELTEX* and NATIONAL REINFORCING,—Address DEPT. K-49.

NATIONAL STEEL FABRIC COMPANY
Union Trust Bldg. Pittsburgh Steel Co *Pittsburgh, Pa.*

IF ECONOMY IS IMPORTANT RIC-WIL IS ESSENTIAL



Because Ric-wiL Conduit is the economical system for the protection and insulation of underground steam pipes. Ric-wiL Conduit is easy and economical to install—it requires less trenching, less extra materials and no special construction.

But the real economy lies in the efficiency and permanence of Ric-wiL Conduit. Ric-wiL Conduit Systems are so well engineered and of such sturdy construction that there is no time limit to their efficiency or permanence. Once installed, Ric-wiL Conduit can be depended upon indefinitely. Thus with Ric-wiL the first cost is the *last cost*—you'll have no yearly replacements or repairs—no lowered efficiency—no staggering after costs.

High efficiencies are a habit with Ric-wiL—test after test of various Ric-wiL installations have shown better than 90%, and a recent test showed 95.6%. And Ric-wiL holds heat losses decidedly lower than can be expected from ordinary conduit.

Ric-wiL Engineers, with over twenty years experience, are at your service. Whatever your problem, they can solve it to your complete satisfaction, both as to economy and efficiency. Write for the Ric-wiL Catalog and Detail Sheets of typical installations.

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2. *Loc-liP Side Joint, a water-tight seal which locks top and bottom halves together.*
3. *External Pipe Supports, rigid, strong, quickly installed.*
4. *Four types of insulation including Dry-paC, to meet every condition.*
5. *Cast Iron Ric-wiL to eliminate expensive special concrete construction.*
6. *Strong, compact interlocking construction throughout.*
7. *Less trenching, less extra materials, [illegible] special construction and such easy rapid assembling in the trench that the installed cost of Ric-wiL is often less than ordinary conduit.*

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Branches: New York · Baltimore · Atlanta · Chicago
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UNDERGROUND CONDUIT
FOR STEAM PIPES

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of course!

But whose
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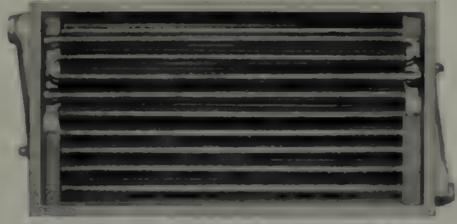
To make sure that you select the right Unit Heater all you need do is make sure that THE HEAT-SURFACE IS



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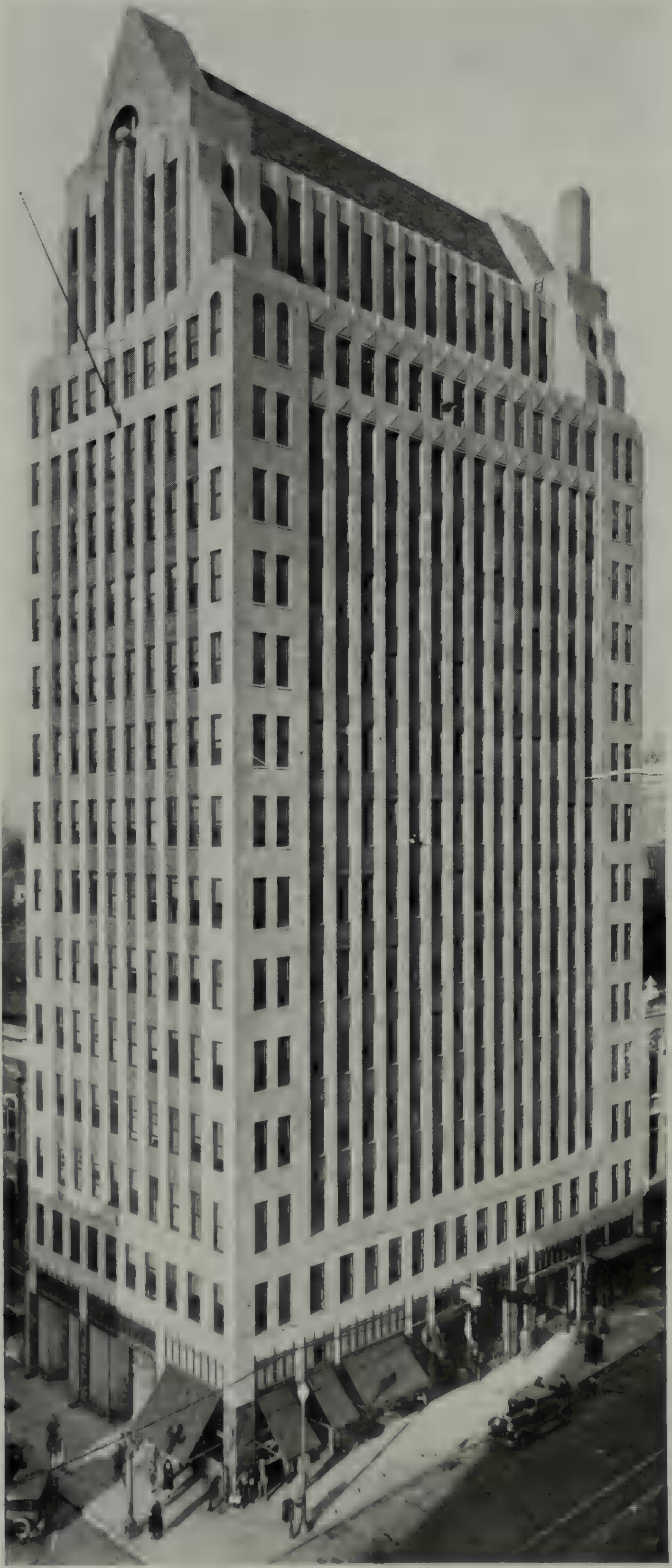
WARREN, KNIGHT AND DAVIS, A.I.A., of Birmingham, is one of the leading architectural firms in the South. Last year this office won the gold medal for the design of the finest office building exhibited at the Southern Architectural and Industrial Arts Exhibition, at Memphis. An honorable mention in public buildings was also won.



This firm was selected, without competition, by Birmingham bankers for the Federal Reserve Bank in that city. The School Board selected Warren, Knight and Davis to build all of the three and a half million dollars worth of Birmingham schools authorized in the last bond issue. The state of Alabama selected this office as architects for several buildings for each of the six normal schools in different parts of the commonwealth.

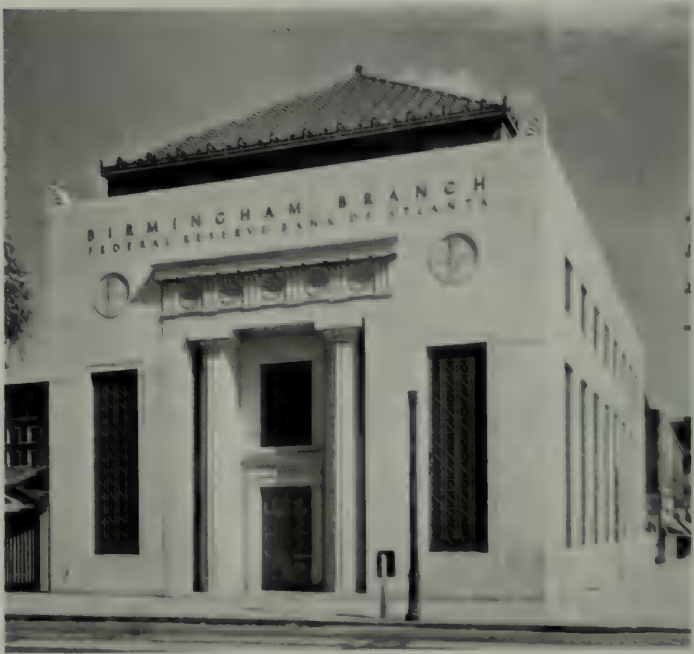
Mr. Warren graduated from Alabama Polytechnic Institute and later from Columbia University. For five years he was in the offices of McKim, Mead & White.

Mr. Knight was trained in several of the larger architects' offices in New York and elsewhere, and also in the Beaux Arts Institute of Design.

Mr. Davis graduated in architecture at Alabama Polytechnic Institute and enjoyed wide experience in the offices of leading Philadelphia and Detroit architects.

Among the notable examples of work done by Warren, Knight and Davis, the following may be mentioned: Alabama Power Company building, Watts building, Protective Life building, Southern Life & Health Insurance building, Jemison Company building, Federal Reserve Bank and Independent Presbyterian Church, all in Birmingham. Engineering, Animal Husbandry, Chemistry and other buildings, at Auburn, for Alabama Polytechnic Institute. Chemistry, Educational and Women's Gymnasium buildings, University of Alabama. Library, Music, Science, Auditorium, Dining Hall, Dormitories and other buildings, Alabama College, Montevallo, Ala.

Left—Watts Building, Birmingham, a recent commission executed by Warren, Knight and Davis. The Birmingham offices of the F. W. Dodge Corporation and the Dodge Plan Room are in this building. Below—Birmingham Branch of the Federal Reserve Bank of Atlanta, designed by the same architects



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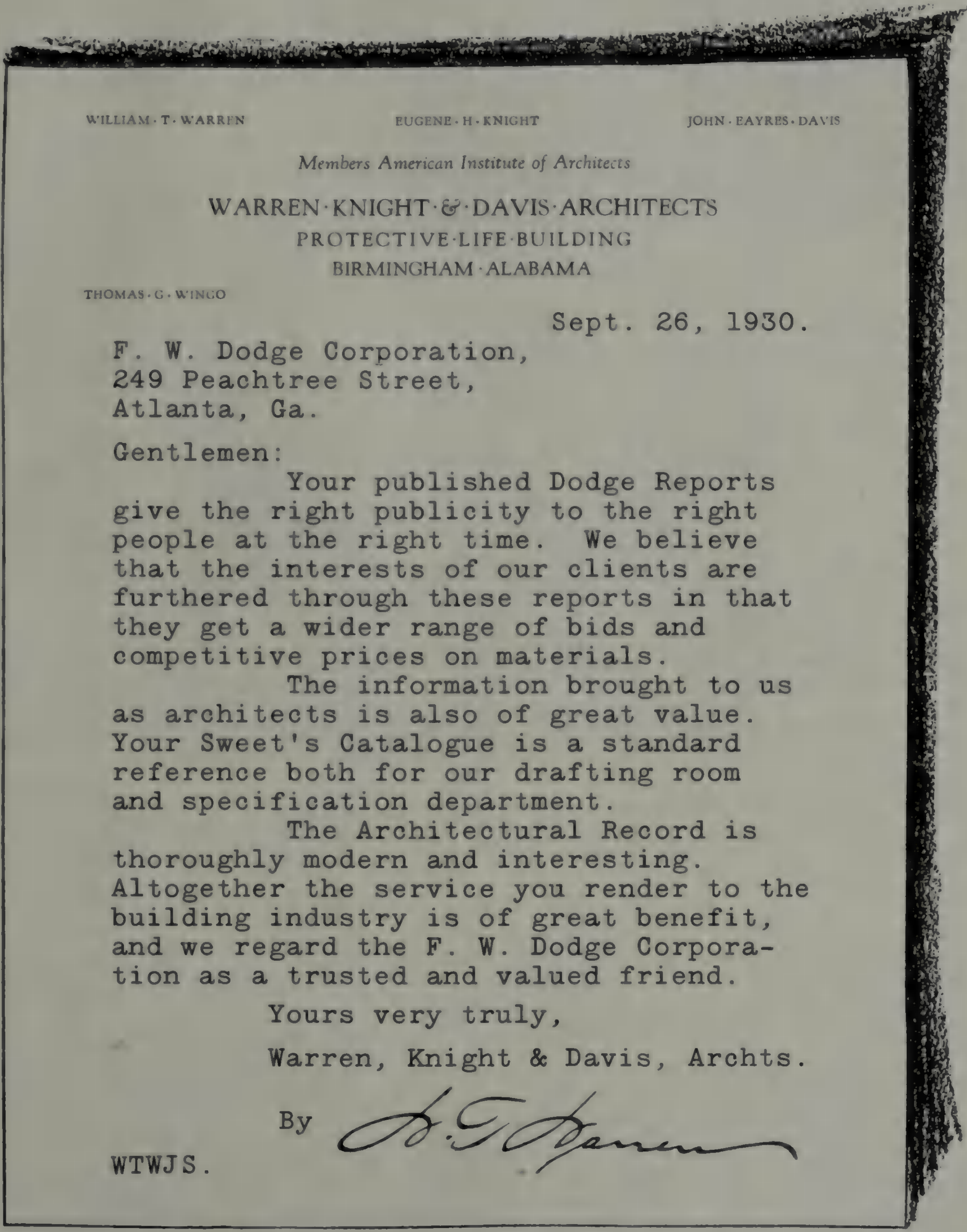

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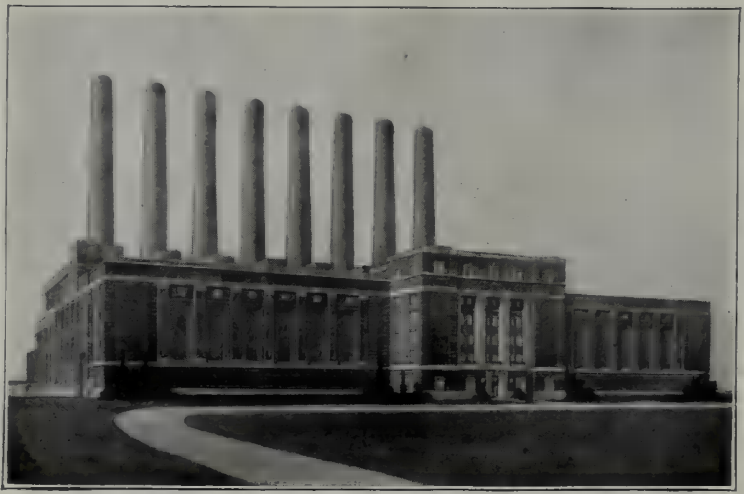

Cleveland Electric Illuminating Company Plant, Ashtabula, Ohio
Architects: Dickerson & Rhoads, Cleveland

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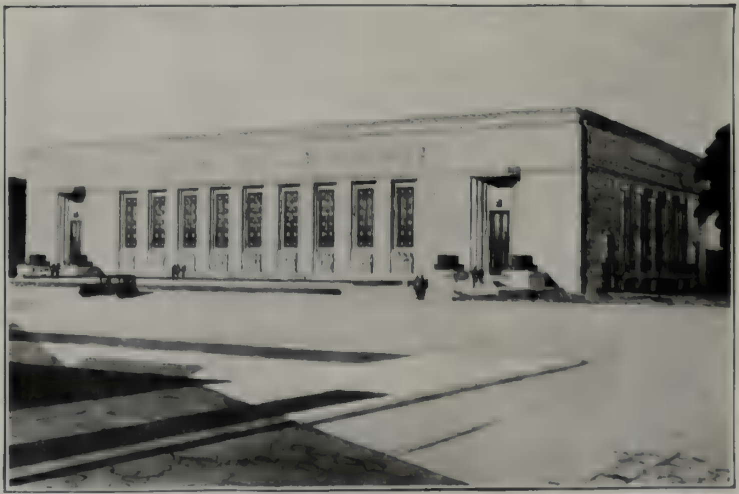

Folger Shakespeare Library, Washington, D. C. Architect: Paul P. Cret

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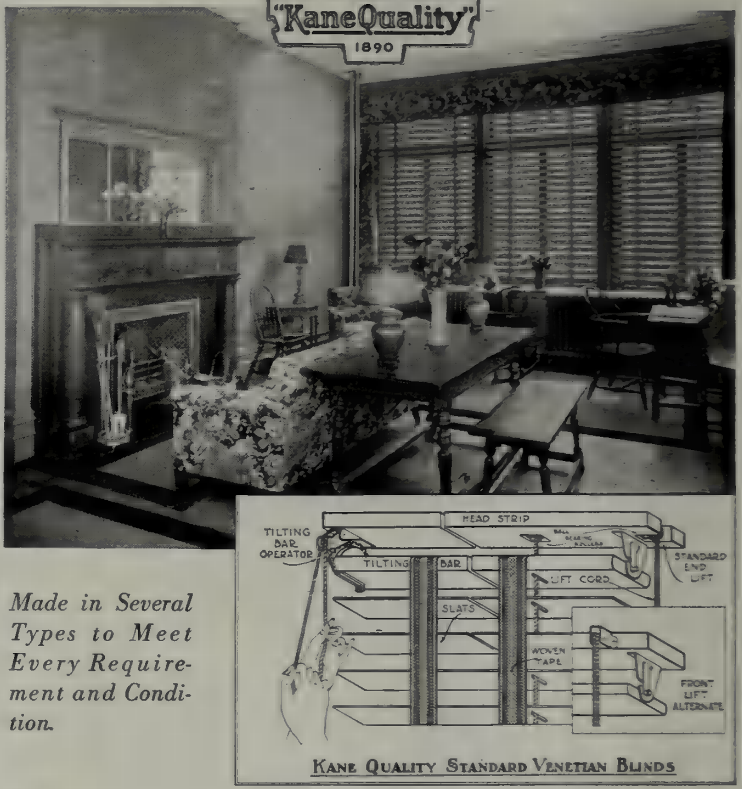

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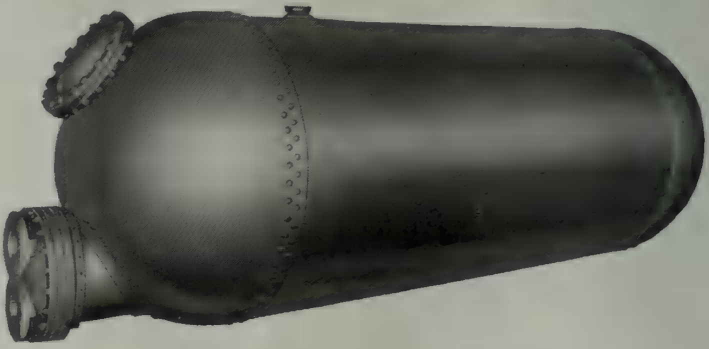

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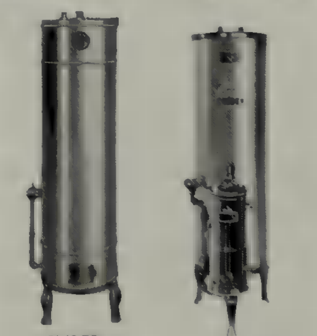

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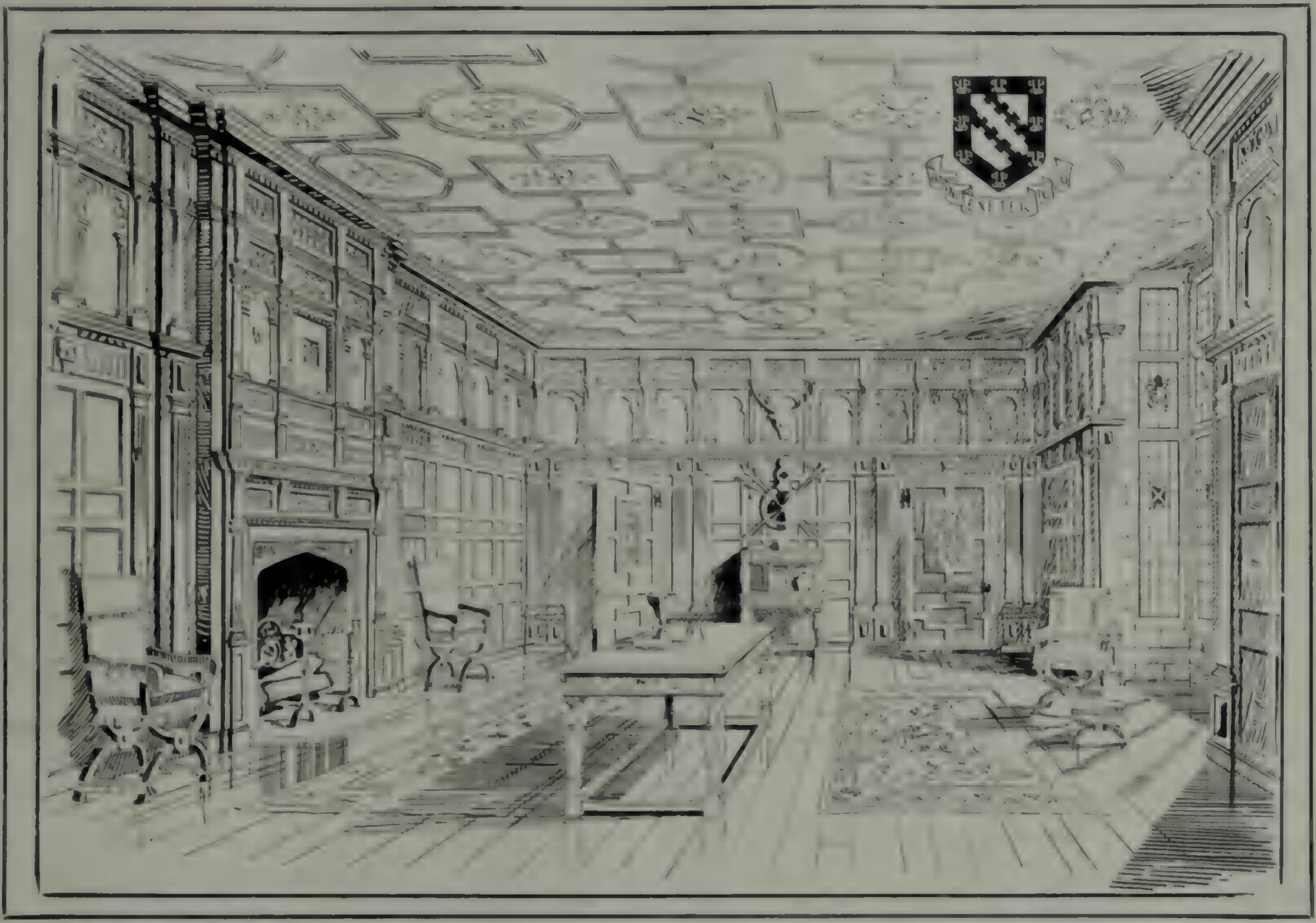

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Full details will be published in the January issue of this publication, or advance information may be obtained now by writing to

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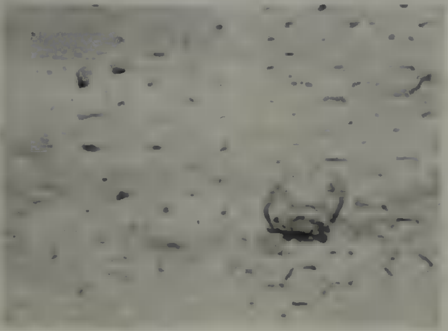
the only Insulating Plaster Base that provides a *Mechanical Key* for the plaster



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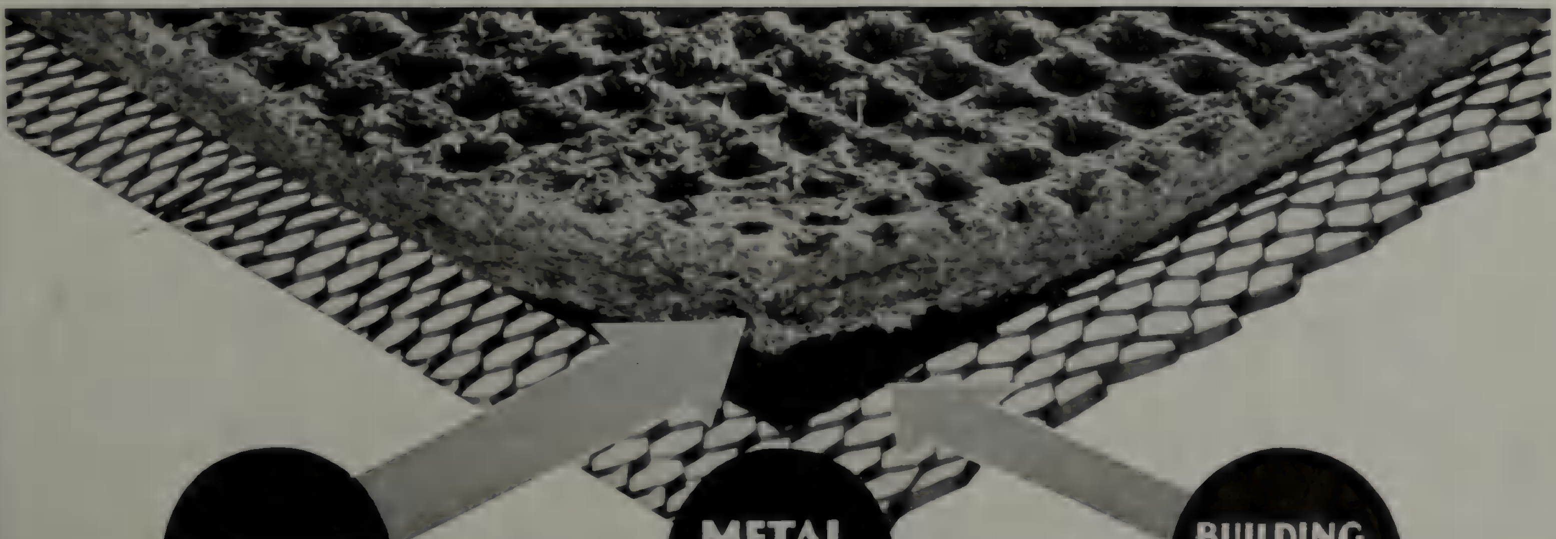

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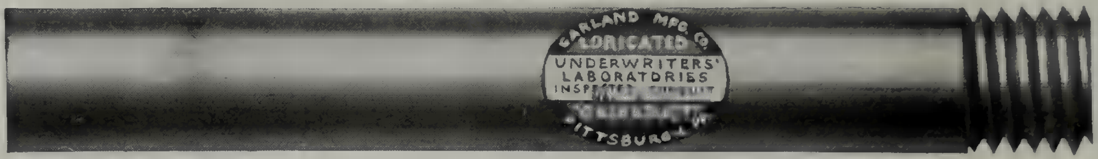

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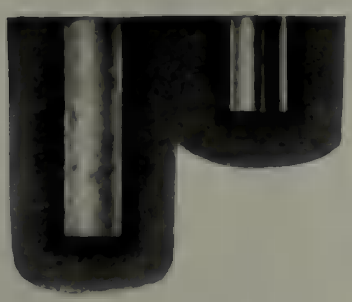
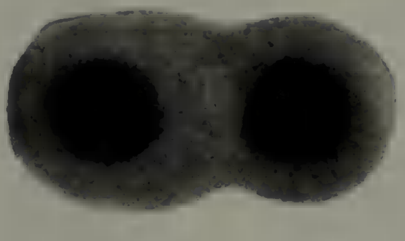


(A) Completed pile, formed by compressing a workable, dry mix concrete under 7 tons pressure. This forces dense concrete into intimate contact with surrounding soil, giving the maximum skin friction. Shading shows relative compression of soil due to driving and compression.

(B) Pile in process of being driven. Steel shell and core displacing and compacting surrounding soil.



Showing line of flow of soil. Soil displaced by pile in process of being driven follows the line of least resistance, which is away from the densely compacted soil surrounding the finished pile.

"TOUGH" jobs, that nobody else wanted, were given to us; completing them successfully built our reputation. Repeat orders from companies for whom we had done the "tough" jobs, built our business.

This is not a plea for more tough jobs, but *when* you have one remember that age has not hardened our arteries. Our advice is unbiased, because we drive, and have driven, every type of pile, in every sort of soil, in every section of the country. The value of our piles and of our service are attested to by the prominent architects and engineers who specify "MacArthur." It is possible that we can serve you also, to our mutual advantage. We will appreciate the opportunity of demonstrating the value of our experience. Send for us when next you have a job requiring piles.

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Experience	20 years	Personnel	capable	Performance	100%
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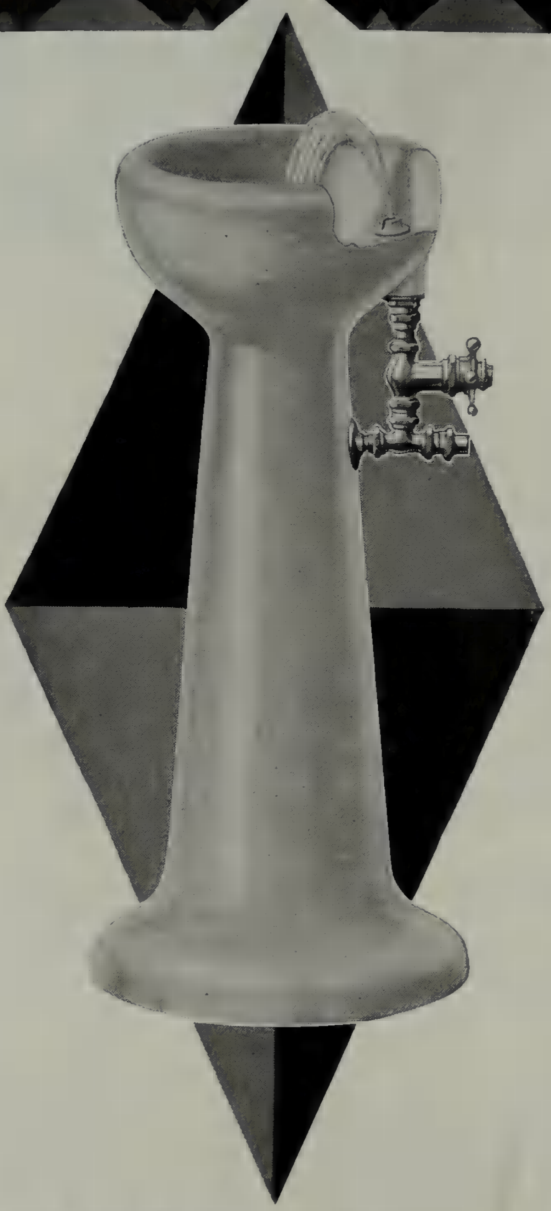

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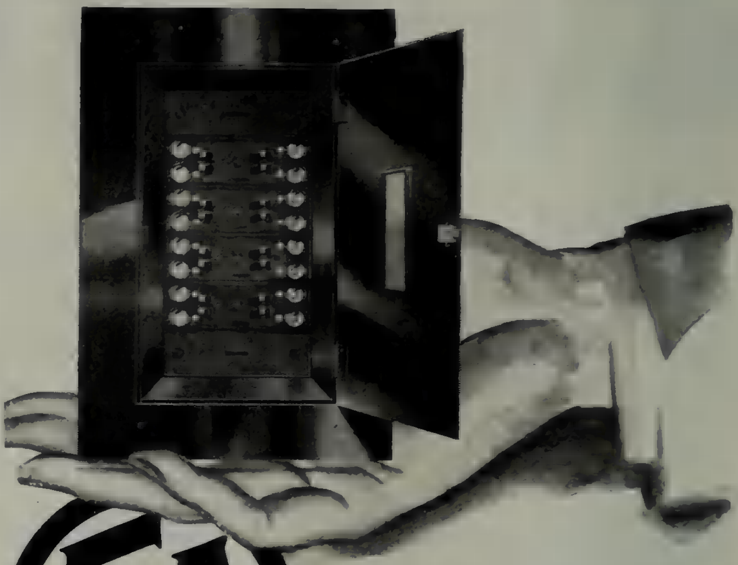

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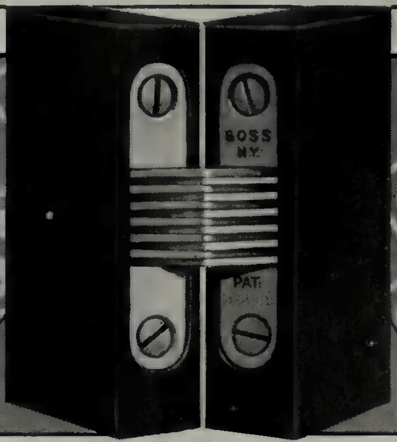

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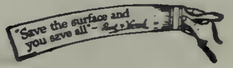
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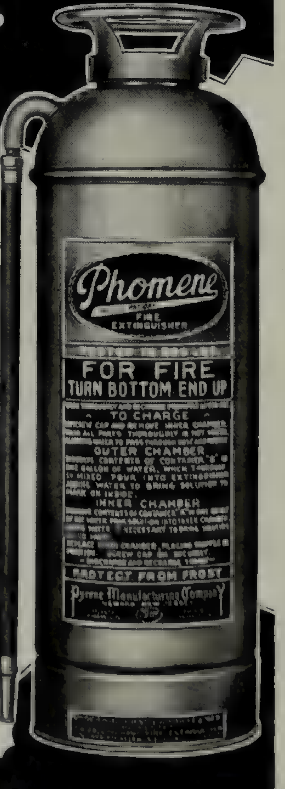

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See Sweet's for 1931, Vol. C 4352

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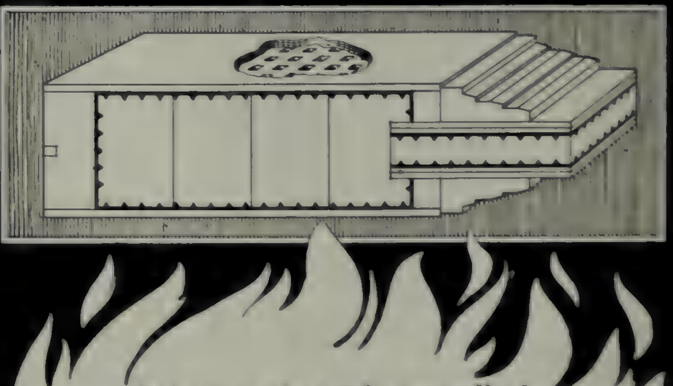

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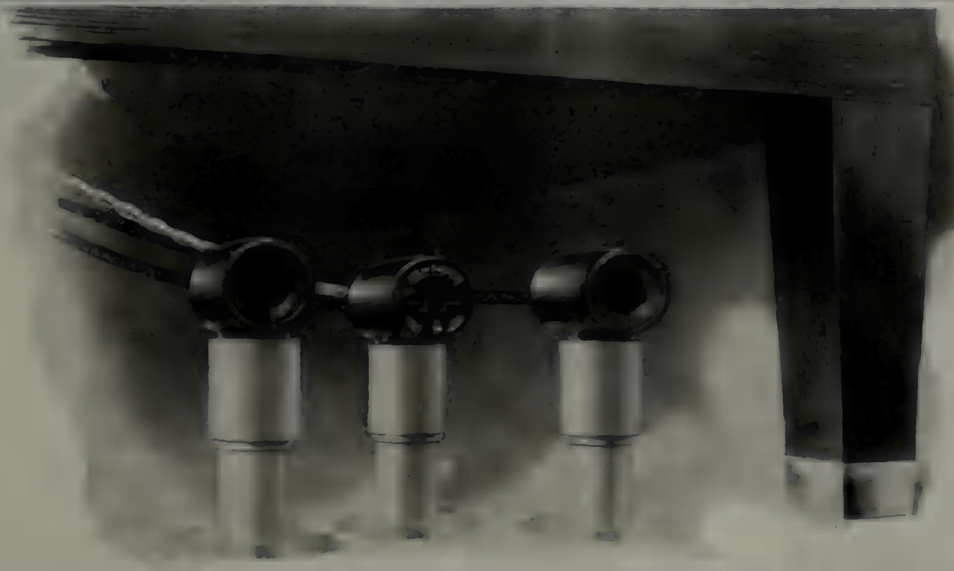

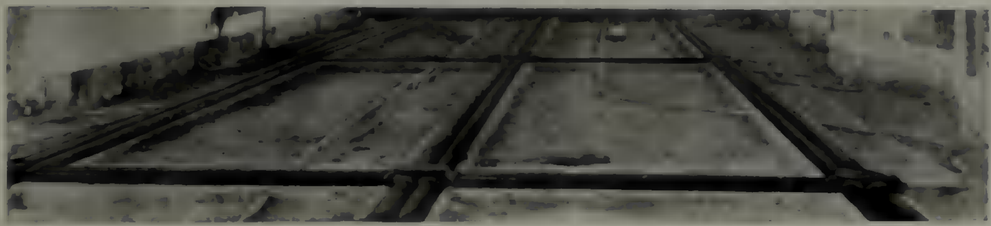

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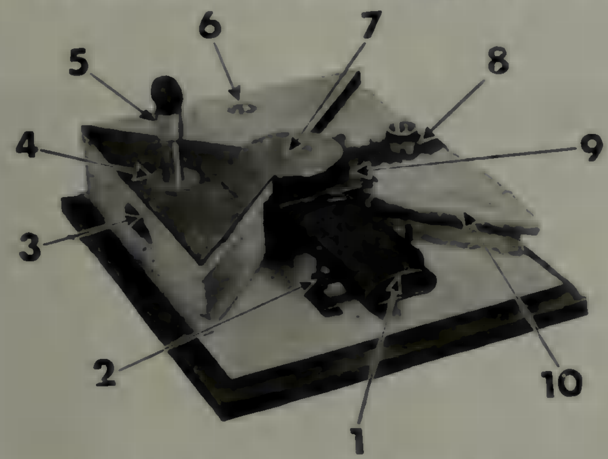

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Our Complete Catalogue is in Sweet's
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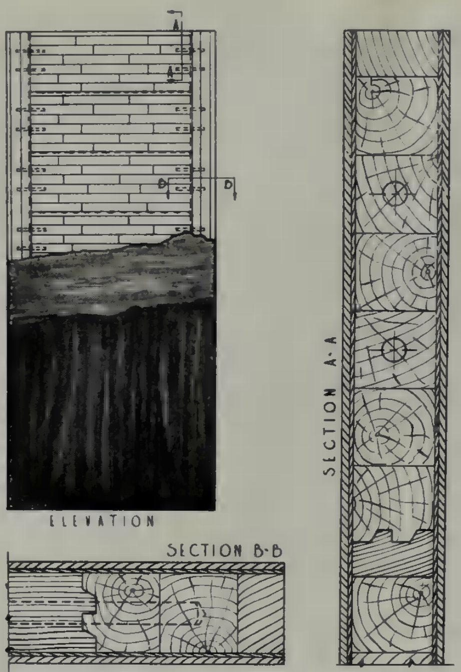

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Alphabetical Index to Advertisers, Page 158

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- **Acid Proof Chemical Stoneware**
  - Knight, Maurice A.
- **Acoustics**
  - Armstrong Cork & Insulation Co.
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  - Milcor Steel Co.
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- **Beams, Angles, Channels, Etc.**
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- **Brass and Bronze**
  - See "Ornamental Metal"
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  Roddis Lumber & Veneer Co.
  Sanymetal Products Co.
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  Thorp Fire Proof Door Company
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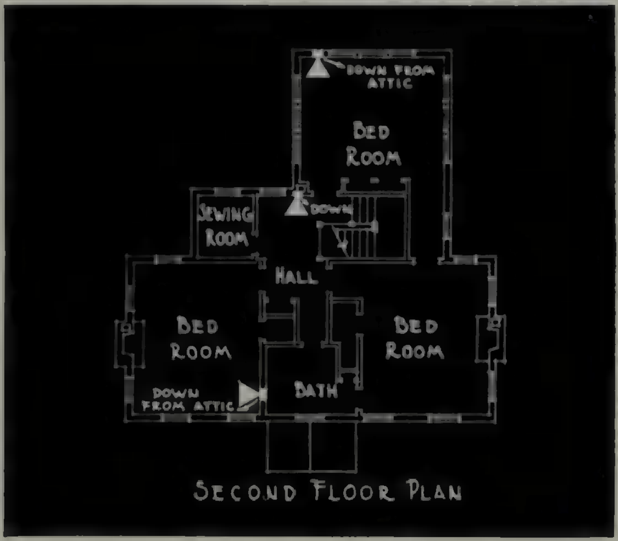
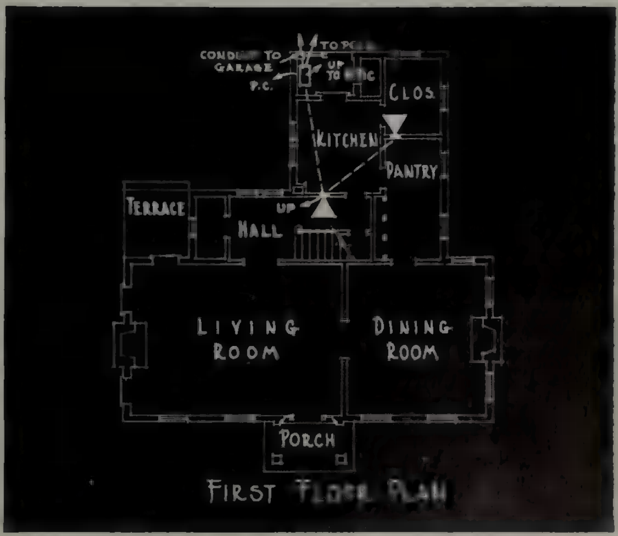


LEGEND
◀ TELEPHONE OUTLET
-------- CONDUIT
▯ PROTECTOR CABINET



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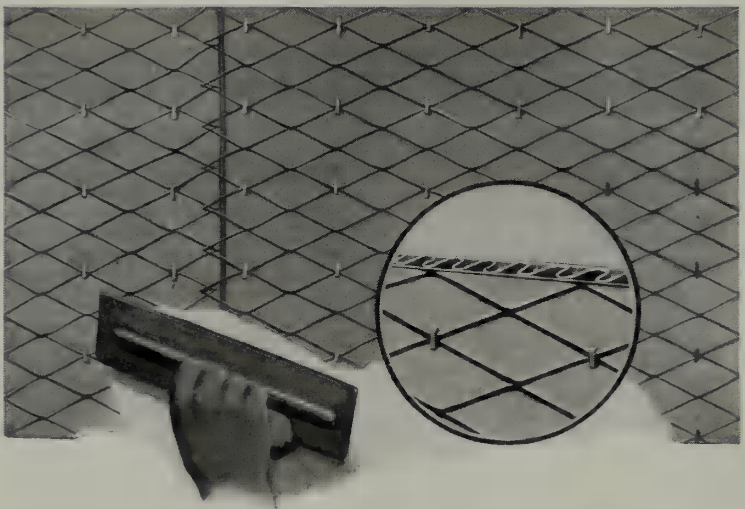

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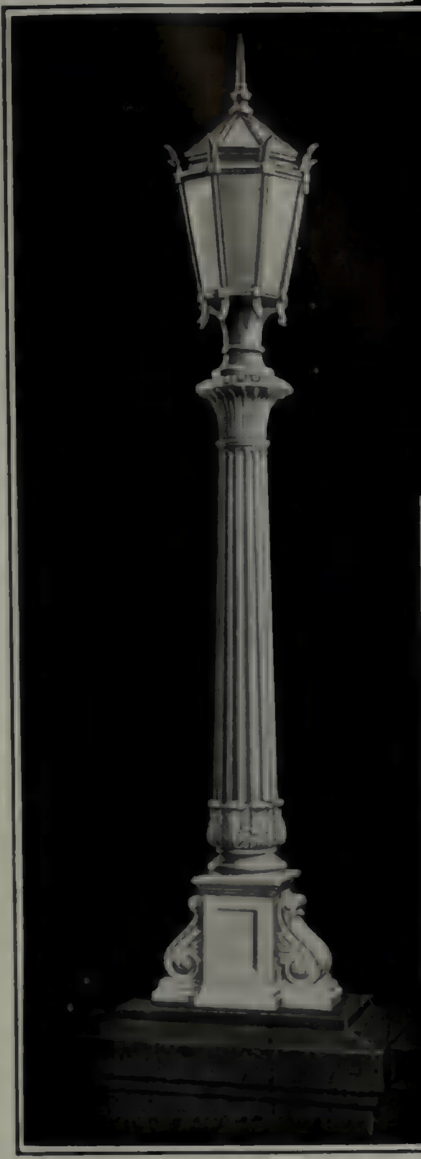

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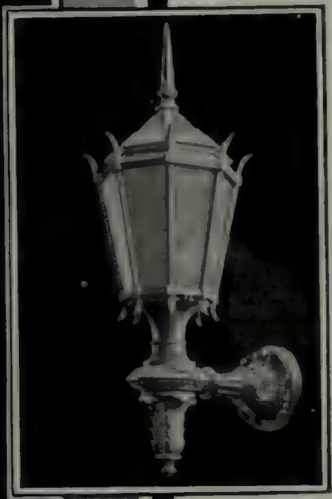

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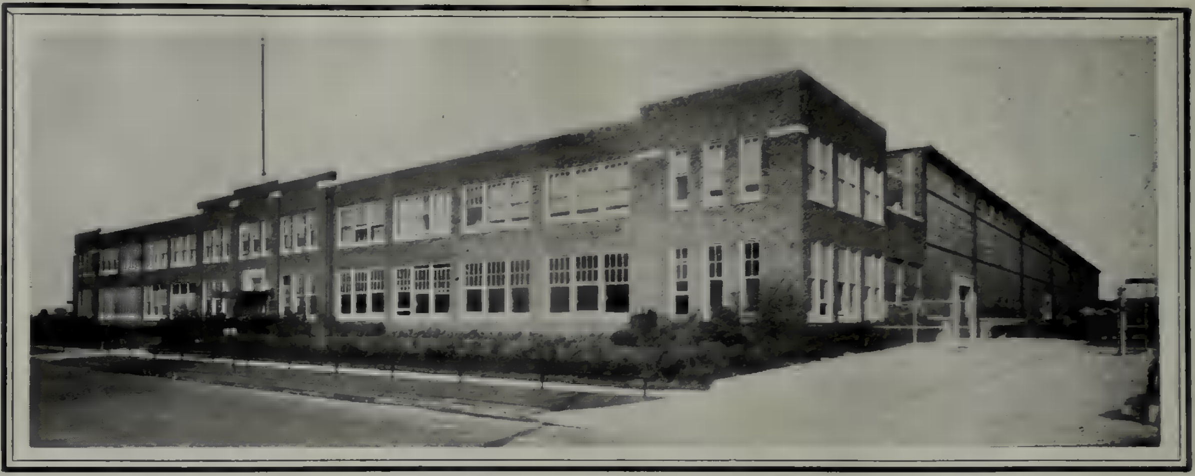

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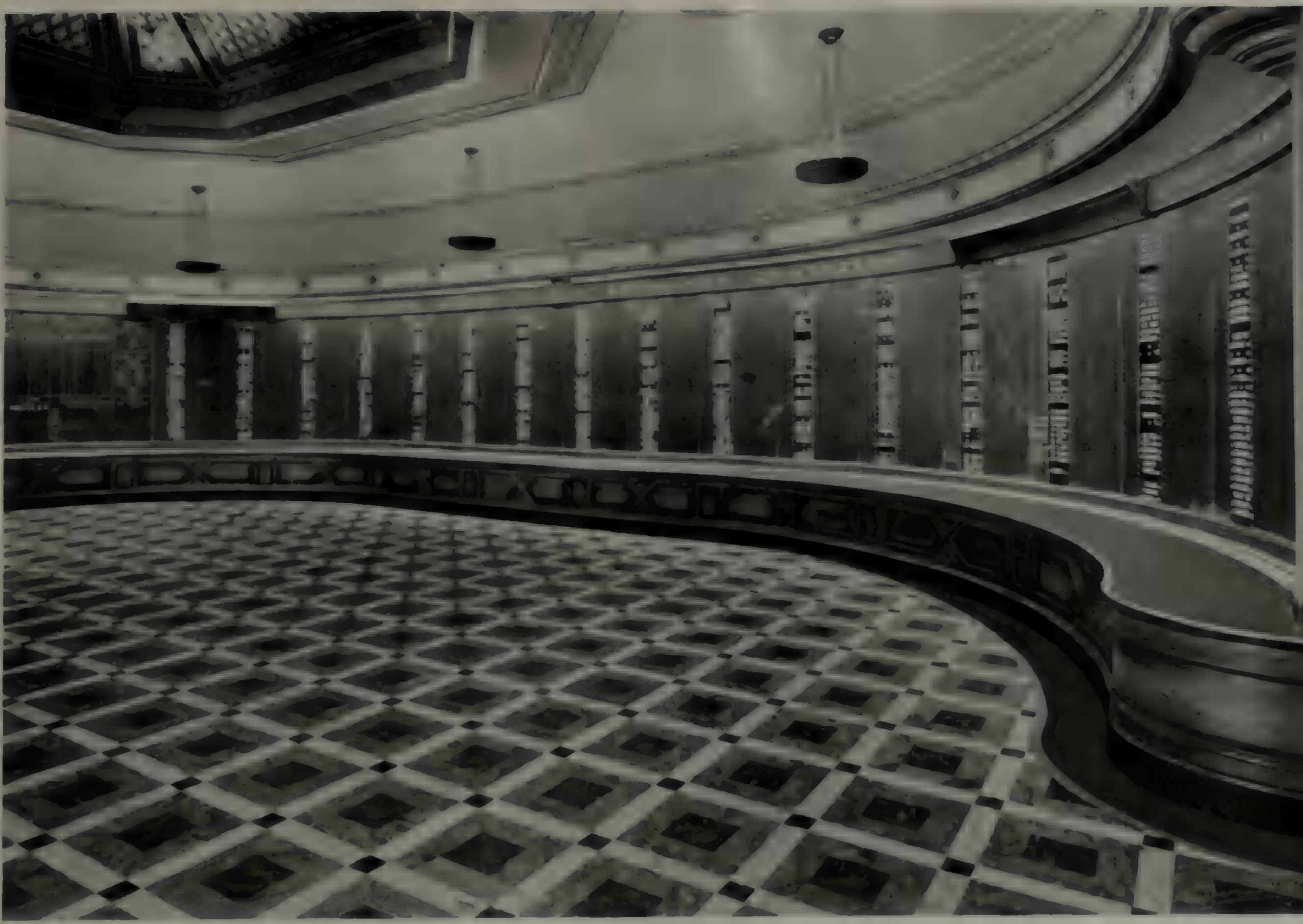

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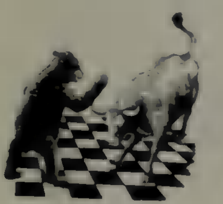

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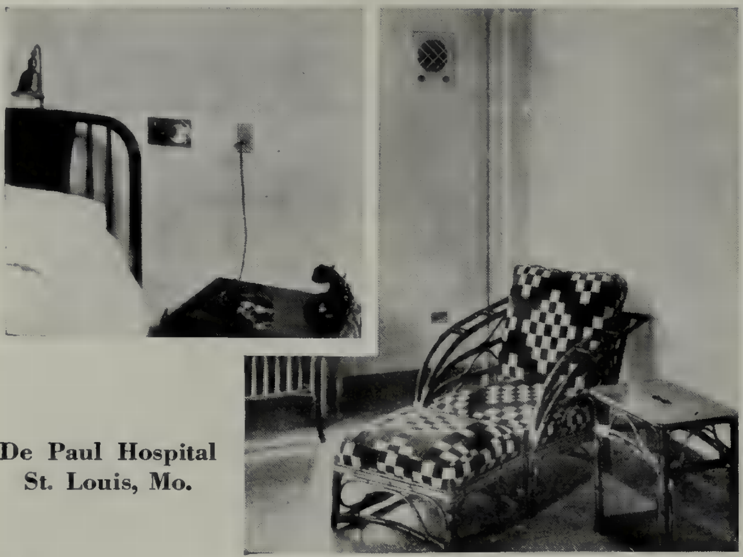

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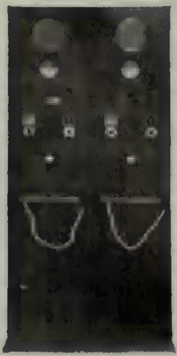

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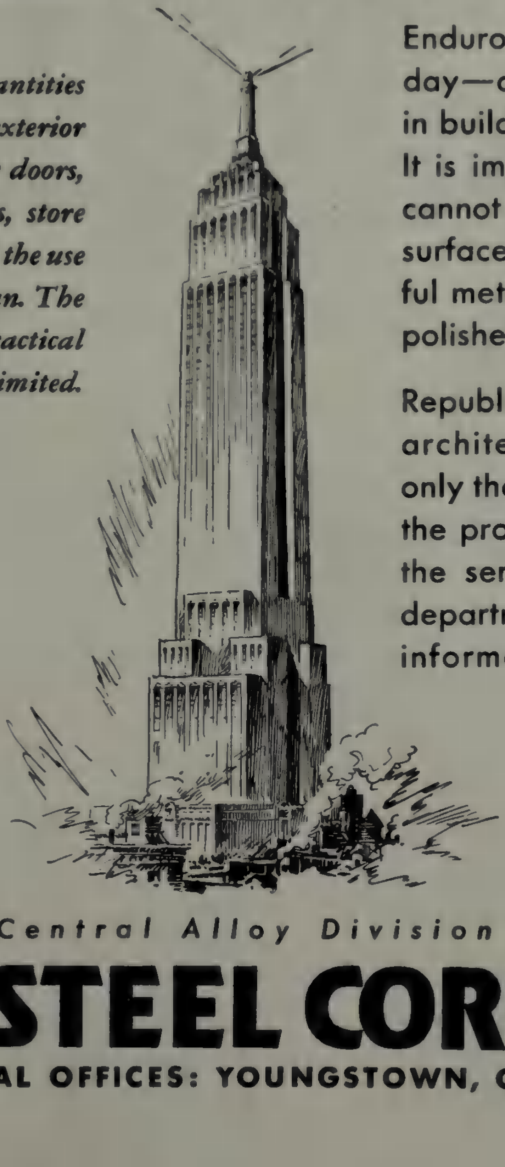

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